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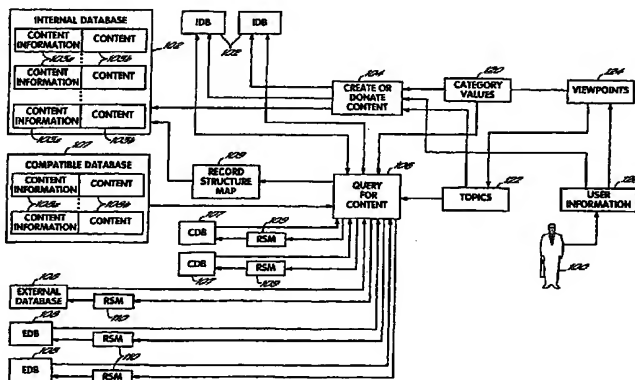
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(54) Title: **KNOWLEDGE MANAGEMENT SYSTEM**



(57) Abstract: A knowledge management system, program product and method utilize a multi-dimensional taxonomy for classifying content items (103b, 108b) in a knowledge management system both by format and content. Classification by format is accomplished by associating an item format (122) with a content item that specifies one or both of the general type and source of a document or record represented by the content item. Classification by content is accomplished by associating with a content item a particular value of one or more categories (120) established for a knowledge management system. Classification of content items is enforced both during creation or addition of content items to a knowledge management system, and during accessing the knowledge management system to view existing content items.

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## KNOWLEDGE MANAGEMENT SYSTEM

### Field of the Invention

The present invention relates to management of knowledge  
5 stored in information processing systems.

### Background of the Invention

Accomplished business organizations usually develop a  
significant amount of specialized expertise in the particular marketplace in  
which they operate, be it through efficient business processes or standards, or  
10 even the specific talents and experiences of their employees. Each of the often  
intangible components that make up an organization's expertise is typically  
referred to as "knowledge" of the organization.

For example, the individual salespersons of a company over  
time usually develop special expertise in marketing specific products or  
15 services of the company. An effective salesperson usually tries to stay on top  
of competitors' products and, often through trial and error, learns how to

competitively market the company's products against those of competitors.

An experienced salesperson also gets to know his or her customers, including how to deal with those customers on a personal level, and what marketing techniques are effective for particular customers, etc.

5                   The effective management of the collective knowledge of a business organization is often critical to the performance of the organization in the marketplace. For smaller organizations, it may be possible to maintain such knowledge simply in the minds' of the organizations' employees.

10                  However, for larger organizations, as well as growing organizations that are regularly hiring new employees, communicating and distributing knowledge throughout an organization can be difficult. Furthermore, while past organizations may have been able to count on employees' continued employment and development of expertise over many years, today's employees are more mobile and apt to leave and pursue other opportunities.

15                  Distributing the knowledge of departing employees to others within the organization is often difficult or simply not possible in the time frame prior to departure of such employees, and as a result, often such knowledge is irretrievably lost by the organization.

20                  To assist business organizations in better retaining and distributing knowledge, computer software applications known as knowledge management systems have been developed. Most knowledge management

systems attempt to organize knowledge, e.g., in the form of documents or records in a database (herein referred to as "content items"), in a structured manner so that such knowledge can be easily accessed by employees.

Accessing knowledge stored in a conventional knowledge management system is often handled through a search engine that operates in essentially the same manner as the search engines used to access other types of computer databases. Typically, users provide one or more keywords that form a search query, and every content item in the system (or an index thereto) is searched to determine the degree of "closeness" of the content item to the search query. The content items deemed "closest" to a search query (as determined, for example, but the number of times the keywords appear) are then returned to the user.

The effectiveness of a keyword search, however, can vary greatly based upon the quality of the search query formulated by a user. Misspelling a keyword or neglecting to include common synonyms of a particular keyword can change the results, and including more common keywords may result in a large number of irrelevant results. Users are rarely given much guidance in formulating search queries, and as such, inexperienced users may have a significant amount of difficulty in retrieving relevant information.

Some conventional knowledge management systems attempt to improve knowledge access through storing or otherwise utilizing additional categorization information with content items as such items are added to the systems. For example, some conventional knowledge management systems permit users to supply a short summary or list of keywords for a content item prior to adding that item to the system. Additional information, such as the author and date of creation of the content item, may also be stored along with the item. Furthermore, automated tools may also be used to build computer generated abstracts or summaries for incoming content items.

To date, however, the amount of additional categorization information utilized by conventional knowledge management systems is not particularly great, and often, little or no enforcement is provided to ensure that the additional information is always or correctly supplied with incoming content items.

Also, in many systems, any user is permitted to add content items to the system, regardless of his or her expertise in the particular subject matter with which a content item is related. With such systems, the quality, or usefulness, of particular content items may not be readily apparent to users. To be able to distinguish between content items submitted by an expert, and other content items submitted by others with no or relatively lesser expertise, would require knowing the relative experience or reputation of the authors of

those content items. Moreover, content items submitted by less experienced users may be more likely to contain unhelpful, misleading, confusing or even incorrect information. Absent actual knowledge of the reputation and experience of different authors, however, users may give greater weight to less  
5 reliable content items.

Some knowledge management systems also incorporate discussion thread databases that maintain a number of discussion “threads”, organized in much in the same manner as conventional news groups. Discussion threads provide users with the opportunity to interactively build an  
10 online discussion about a particular subject. Often, a user that has a particular question will create a new discussion thread and post an initial message to that thread asking for assistance. Other users are then able to view the message, and if appropriate, respond to the inquiry by posting a reply message to the thread. Each message in a thread is stored and tracked so that other users can  
15 follow a discussion simply by viewing the sequence of messages posted to the thread.

One problem associated with conventional discussion thread databases is that the categorization of discussion threads is often not well defined. Multiple discussion groups are typically available, with each  
20 intended to address a particular subject area of interest. The subject matter of each discussion group is typically specified by the name of the group using a

hierarchical naming convention. However, users are often permitted to create new threads in any discussion group that the users desire, even if the threads are not relevant to the subject matter of the group. As such, there is no assurance that a discussion thread within a particular discussion group is at all related to the subject matter of the group. In addition, searching across multiple discussion groups is supported; however, searching is typically limited to keyword based search queries. As such, the aforementioned searching limitations typically impede the relevancy and utility of discussion group searches.

Therefore, a significant need continues to exist in the art for improving the structuring, authoring and accessing of knowledge in a knowledge management system.

#### Summary of the Invention

The invention addresses these and other problems associated with the prior art by providing a knowledge management system, program product and method that utilize a unique multi-dimensional taxonomy for classifying content items in a knowledge management system. In particular, content items in a knowledge management system are each classified both by format and content. Classification by format is accomplished by associating an item format (also referred to hereinafter as a topic) with a content item that specifies one or both of the general type and source of a document or record

represented by the content item. Classification by content, on the other hand, is accomplished by associating with a content item a particular value of one or more categories established for a knowledge management system. Item formats and categories may be considered to be related in the same manner in which nouns are related to adjectives, or in which form is related to substance.

Classification of content items by both format and content is enforced both during creation or addition of content items to a knowledge management system, and during accessing the knowledge management system to view existing content items. Moreover, in the embodiments illustrated hereinafter, discrete item formats and category values are defined, the end result being that a simplified search query interface may be utilized that permits a user to select one or more discrete item formats and/or values to perform a search. As opposed to keyword based searching, where the results can vary based upon the particular manner in which a user assembles keywords, the invention reduces the degree of skill and experience needed to access relevant content items. The end result is typically improved access to the content items by end users, and thus a more efficient distribution of knowledge throughout a business organization or other organization of users that utilizes the knowledge management system.

Consistent with one aspect of the invention, the item formats and categories defined by a knowledge management system are interrelated in



such a manner that values are selected by an author of a new content item only for categories that are determined to be relevant to a particular item format with which the new content item is associated. Specifically, in authoring a new content item, a knowledge management system supporting such a feature receives user input from a user that specifies an item format with which to  
5 associate a new content item. The user is presented with a subset of categories from a plurality of categories based upon the item format specified by the user. The system also receives user input from the user that specifies one or more values for one or more categories in the subset of categories with which to  
10 associate the new content item. The new content item is added to the knowledge management system with the specified item format and the specified category value(s) associated with the new content item.

Consistent with another aspect of the invention, collaboration among users of a knowledge management system is encouraged by  
15 constraining combinations of item formats and category values to support at most only one content item per unique combination. Specifically, when authoring a content item, a knowledge management system supporting such a feature receives user input from a user that specifies an item format and a value of a category with which to associate a new content item. The system  
20 also determines whether an existing content item in the knowledge management system matches the item format and category value specified by

the user. If so, such existing content item is displayed to the user for editing in lieu of creating a new content item.

Consistent with another aspect of the invention, the quality and reliability of content items added to a knowledge management system are  
5 ensured by utilizing a matrix of responsible entities to authorize, or "bless", content items donated to the system both on the basis of format and content. Specifically, when authoring a content item, a knowledge management system supporting such a feature receives a donated content item associated with an item format and a category that classifies at least a portion of the content of the  
10 content item. The donated content item is forwarded to a first responsible entity associated with the item format associated with the donated content item to obtain authorization therefrom. The donated content item is also forwarded to a second responsible entity associated with the category associated with the donated content item to obtain authorization therefrom. Then donated content  
15 item is then accepted into the knowledge management system after authorization is obtained from both of the first and second responsible entities. As such, the appropriateness of both the format and the content of a donated content item may be ensured in a structured and efficient manner.

Consistent with a further aspect of the invention, a method is  
20 provided for creating a knowledge management system for an organization. The method includes collecting information from an organization relating to

both the types of content items to be stored and the taxonomy of information in the knowledge management system, defining a plurality of item formats representative of the types of content items to be stored in the knowledge management system, defining a plurality of categories representative of the taxonomy of information to be stored in the knowledge management system, and associating each of a plurality of content items with at least one item format and at least one category. Through such a structured development protocol, a well organized knowledge management system can be developed from the ground up in a systematic and efficient manner.

Consistent with yet another aspect of the invention, multiple search filters (also referred to herein as viewpoints) may be defined for a knowledge management system or other database to customize the search options available to a user based upon the user's identity. Specifically, a database accessible via a search query generated using a set of search term lists may be searched by initially selecting among a plurality of search filters based upon the identity of a user attempting to access the database. Each search term list includes a discrete number of search terms. Each search filter defines a subset of search term lists from the set of search term lists, and is used to filter user input from the user to generate a search query for the user. The search query generated from the filtered user input is then used to access the database. As a result, different users may (at least initially) be presented

with only those search term lists (and/or particular search terms from such lists) that are particularly relevant to such users, with other potentially confusing and unhelpful search terms and/or lists kept from the users, thereby simplifying the search process for even the least experienced users of the database.

5

Consistent with still another aspect of the invention, access to a discussion thread database, whether or not implemented within a knowledge management system, may be facilitated by associating at least some discussion threads stored in the database with values for multiple categories that classify the contents of such discussion threads, and that are comprised of discrete numbers of values. Specifically, while accessing a discussion thread database, user input is received from a user that specifies first and second values for first and second categories, respectively. It may then be determined whether a discussion thread among the plurality of discussion threads matches the first and second values of the first and second categories. If so, such matching discussion thread is displayed to the user. Having discussion threads classified by more than one category of discrete values in this manner introduces a more structured organization to discussion threads, in much the same way that content items are structured in a knowledge management system consistent with the invention. As a result, improved organization and retrieval capabilities may likewise be realized in a discussion thread database.

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It will be appreciated that the invention encompasses the methods described, as well as computer systems programmed for carrying out these methods, and computer software that when loaded into a computer system will program the computer system to carry out these methods.

5 Software of this kind may be delivered through a signal-bearing computer-readable media, such as a communications link (e.g., an Internet connection) or a recordable media such as magnetic or optical storage.

The above and other objects and advantages of the present invention shall be made apparent from the accompanying drawings and the  
10 description thereof.

#### Brief Description of the Drawing

The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate embodiments of the invention and, together with a general description of the invention given above, and the  
15 detailed description of the embodiments given below, serve to explain the principles of the invention.

Fig. 1 is an overall functional diagram of the operation of a knowledge management system in accordance with principles of the present invention, showing a user's interaction with the system and the data managed  
20 thereby;

Fig. 2A is a data structure diagram illustrating information stored for categories used in management of data in accordance with principles of the present invention, and Figs. 2B, 2C, 2D and 2E are printouts of exemplary screen displays used in collecting information on categories;

5 Fig. 3A is a data structure diagram illustrating information stored for topics used in management of data in accordance with principles of the present invention, and Figs. 3B, 3C, 3D and 3E are printouts of exemplary screen displays used in collecting information on topics;

10 Fig. 4A is a data structure diagram illustrating record structure maps used in managing databases in accordance with principles of the present invention, and Figs. 4B, 4C, 4D and 4E are printouts of exemplary screen displays used in collecting information on databases;

15 Fig. 5A is a data structure diagram illustrating viewpoint definitions used in management of data in accordance with principles of the present invention, and Figs. 5B, 5C and 5D are printouts of exemplary screen displays used in creating viewpoint definitions;

20 Fig. 6A is a data structure diagram illustrating user information used in management of data in accordance with principles of the present invention, and Figs. 6B and 6C are printouts of exemplary screen displays used in collecting user information;

Fig. 7A is a data structure diagram illustrating content information used in management of data in accordance with principles of the present invention, and Figs. 7B, 7C and 7D are printouts of exemplary screen displays used in collecting information on content;

5                    Fig. 8 is a printout of an exemplary screen display showing a menu of user functions that utilize the various data structures described above;

                  Fig. 9A is a flow chart of the author support and donation processes for adding knowledge in accordance with principles of the present invention, and Figs. 9B, 9C, 9D and 9E are printouts of exemplary screen  
10                   displays generated through this process;

                  Fig. 10A is a flow chart of the search process for finding knowledge in accordance with principles of the present invention, and Fig. 10B is a printout of an exemplary screen display generated through this  
                  process;

15                   Fig. 11A is a flow chart of the process for initiating or locating a discussion in accordance with principles of the present invention, and Figs. 11B and 11C are printouts of exemplary screen displays generated through  
                  this process; and

                  Fig. 12A is a flow chart of the process for locating a subject  
20                   matter expert in accordance with principles of the present invention, and Figs.

12B, 12C, 12D and 12E are printouts of exemplary screen displays generated through this process.

Detailed Description of Specific Embodiments

Referring now to Fig. 1, a knowledge management system in accordance with the principles of the present invention utilizes a variety of data structures to facilitate access of a user 100 to one or more databases 102, 107 and 108 containing content or knowledge of interest to user 100.

The databases accessible to user 100 include one or more internal databases 102 created and managed by the knowledge management system and formatted appropriately for the knowledge management system. Three such databases 102 are illustrated in Fig. 1.

The databases available to user 100 further include one or more compatible databases 107. Databases 107 were not created by the knowledge management system, but have formats which are compatible with the knowledge management system and can be readily accessed by the knowledge management system.

The internal and compatible databases 102 and 107 are formatted in a manner facilitating retrieval of the content in those databases. Specifically, in internal databases 102, content 103b is associated with a content information data structure 103a storing information about that content, as is elaborated below with reference to Figs. 7A through 7D. Similarly, in



compatible databases 107, content 108b is associated with a content  
information data structure 108a storing information about that content.

Retrieval of content from the internal or compatible databases 102 or 107  
involves applying search criteria to the content information of all content in  
5 the database to select that content which is desired, as is elaborated below.

The knowledge management system also accesses data in one  
or more external databases 108. Databases 108 are not directly compatible  
with the knowledge management system but can be searched by the  
knowledge management system to obtain usable content as will hereafter be  
10 discussed.

In the embodiment explained herein, the knowledge  
management system is implemented as a Lotus Notes database, using the  
Lotus Notes database management and contact management software that is  
available from Lotus Development Corporation, a subsidiary of International  
15 Business Machines Corporation of Armonk, New York. The examples  
provided below are from a Lotus Notes implementation of a knowledge  
management system. It will be appreciated, however, that a knowledge  
management system in accordance with the principles of the present invention  
can be implemented using other database management tools, including tools  
20 that facilitate completely custom design of a database system such as the  
Visual Basic or Visual C++ source language compilers.

In the context of a Lotus Notes implementation of a knowledge management system, internal databases 102 and compatible databases 107 are Lotus Notes databases which are available within the business organization of the user 100 or within business organizations to which user 100 has a gateway connection using Lotus Notes protocols. Typical Lotus Notes databases include databases of contacts, databases of schedules, and databases for managing content created by an organization under the Lotus Notes protocols. Internal databases 102 are those created using templates established by the knowledge management system as described below. In the present embodiment, compatible databases 107 may be any other Lotus Notes database accessible to user 100 through his local business organization or any connected business organization.

In a Lotus Notes implementation, external databases 108 are those which are not created or managed by the Lotus Notes environment, but are accessible to users using Lotus Notes. These include various dBASE format or other database format databases which may be available locally, and may also include databases accessible through the Internet at publically available servers, for example, servers having a search interface accessible through a browser via the World Wide Web. Databases may also be directly accessed from a file server or a shared storage device.

User 100 may interact with databases by creating or donating content via a module 104 of the knowledge management system, or by querying for content using a module 106 of the knowledge management system. Content which is created or donated using module 104 is delivered to the internal databases 102, in a format consistent with those established by the knowledge management system. Queries for content using module 106 can act upon databases 102 which are internal to the knowledge management system as well as upon compatible databases 107 and external databases 108. Thus, a user 100 may create content which is directly compatible with the knowledge management system, but may access content from various other systems or sources of data where that data is useful or relevant.

Queries directed to internal databases 102 via module 106 may be directly applied to those databases since they are formed appropriately for the knowledge management system. Queries directed to a compatible database 107 is converted using a record structure map 109 associated with the database 107. As can be seen in Fig. 1, each compatible database 107 is associated with its own structure map 109 used for converting queries into an appropriate format for delivery to the compatible database 107. Similarly, queries delivered to external databases 108 are converted using a record structure map 110. The content of record structure maps 109 and 110 will be discussed below with reference to Fig. 4A.

When content is created or donated through module 104 or when a query is made for content through module 106, the content being created, donated or queried is categorized using category values 120.

Category values 120 are defined through a process described below, using a module 120 and delivered to either the module 104 for creating or donating content for module 106 for querying for content. Category values describe the desired content in a way that an adjective describes a noun.

Queries for content, and content which is created or donated, are also categorized using topics. Topics are defined by a module 122 and delivered to module 104 when content is created or donated, and delivered to module 106 when content is queried. A topic corresponds to a type of content that is available, for example, trip reports, product reviews, or other forms of content. Topics may be viewed as data types for content. Topics are thus analogous to nouns; they are the objects that are described by the categories.

A user 100 selects content from databases by providing a category value or multiple category values, and providing a topic or multiple topics of interest. These are then applied to the databases in the manner described below to select content of interest to the user 100, and deliver that content to the user 100.

The knowledge management system of Fig. 1 includes facilities for simplifying the process of creating content and querying for content.

Specifically, users are channeled into the system through one of a number of viewpoints managed by viewpoint module 124. The user's viewpoint provides category values and topics for the user which may be of interest based on that viewpoint. The user may modify these category values or topics if desired, or may chose a different viewpoint, and then execute a query or create content to interact with the system. The use of viewpoints in this matter substantially simplifies the process or gathering and creating knowledge, particularly for users that are relatively unsophisticated. Viewpoints free the users from learning the intricacies of the database structures.

Each user 100 is associated with user information 126 that characterizes the user and his or her role in the organization in which the knowledge management system is used. Among other things, user information 126 is used to assign each user to a default viewpoint.

Referring now to Fig. 2A, the structure of records in module 120, which store categories and their values, can be discussed. For each category managed by the system there is a category record 130. Four such records are shown in Fig. 2A, one of which is expanded to show the fields descriptive of the category. The fields descriptive of a category include a name field 132 storing a textual name for the category, a description field 134 storing a multiple or single sentence characterization of the category, and a caption field 136 storing a short version of the description of the category.

In addition to these text fields, each category record includes a field 138 identifying a subject matter expert for the category. The subject matter expert field 138 cross-references to user information for the person who is most expert about the meaning of the category and its appropriate use in the knowledge management system.

Categories further include one or more category value fields 140 each identifying a value for the category. Each category value field 140 is further associated with a subject matter expert field 142, identifying if appropriate a subject matter expert for the category value. The subject matter expert field 142 cross references to user information for a person who is most expert on the meaning of the category value in the associated field 140 and its appropriate use. A plurality of category values and subject matter expert fields may be included in the category record, depending upon the number of categories values that the category has been defined to have.

Referring now to Fig. 2B through Fig. 2E, the process of defining and managing categories can be explained. Figs. 2B to 2E are screen printouts of execution of a Lotus Notes application embodying principles of the present invention. As seen in Fig. 2B, in the workbench screen of this system, a left hand column 150 forms a menu of possible data structures to evaluate and modify. In Fig. 2B, the categories menu item 152 has been selected. When this is done, a window 154 displays the currently defined

categories. In the illustrated example, these categories include "competitor", "decision maker", "document type", "market segment", "product", and "technology"; however, the categories are configurable, and for other implementations other categories could be defined. The user may press one of the menu items in menu 156 to create a new category, edit an existing category or delete an existing category. In the current example, menu item 158 for editing an existing category is pressed to display the screen shown in Fig. 2C.

As seen in Fig. 2C, to edit an existing category, a screen is displayed showing the content of the category record. This content includes the name 132, description 134 and caption 136 of the category. The user is able to alter the description and caption as desired to redefine the category. Also seen in Fig. 2C is a menu item 160 identifying the subject matter expert for the category 160. The subject matter expert for the category is obtained from field 138 of the category record (Fig. 2A). The subject matter expert for the category may be changed or removed using the buttons 162 as seen in Fig. 2C.

Also seen in Fig. 2C is a window 164 identifying the category values for the category being viewed. In the current example, these values include "fast implementation", "integrate data quickly", "provide fast value", and "smart sales people"; however, the categories values are configurable, and for other implementations other category values could be defined. When a

category value is selected in window 164, the subject matter expert for that value is displayed in area 166. The subject matter expert for a value may be changed using buttons 168. Furthermore, a category value may be added or deleted, or the category values may be sorted and individual category values may be modified using buttons 170 associated with window 164.

As illustrated in Fig. 2C, when the modify button 170 is pressed, a dialog box 172 is generated prompting the user to enter a new value for the category. In the illustrated situation, the user is being prompted to modify the value "integrate data quickly". When the user presses the "OK" button in this dialog box 172, the new value is stored in the category record.

As seen in Fig. 2D, category value modifications can be propagated throughout the internal databases. Specifically, when a category is modified in the manner shown above with reference to Fig. 2C, a dialog box 174 is displayed to the user asking the user whether the change that has been made should be propagated throughout all of the internal databases, including those with advocated and those recognized content. This update is important because content currently in the database will be associated category values that were current at the time the content was created, and will have to be updated in order for queries using new category values to locate that content. If the user pushes the YES button 176 in dialog box 174, then all database records having the old category value will be modified to have the new



category value. If the user presses the NO button 178, then this propagation step will be skipped.

Referring now to Fig. 2E, when a subject matter expert for a category or value is to be changed, by pressing either the change button 162 or the change button 168, a dialog box 180 is generated and displayed to the user. This dialog box 180 includes a list of all persons who have the status of subject matter expert in the database of user information. A subject matter expert for a category or for a category value can be chosen from the list in dialog box 180 to assign a subject matter expert to category or category value.

Referring now to Fig. 3A, the topic records which store information for about topics for module 122 can be described. A plurality of topic records 190 are stored by the knowledge management system, each of which describes a particular topic. Four topic records are illustrated in Fig. 3A, one of which is expanded to show the fields used to describe the topic.

As noted above, topics are types of information, e.g. documents, that are stored by the system. The concept of arranging information in a knowledge database into topics and subtopics was originated by Carl Binder of Binder Riha Associates. This approach has been adapted and expanded in accordance with the principles of the present invention to provide automated management of topics and automated use of topics in the creation and querying for data.

The fields that describe a topic 190 include name field 192 providing a name for the topic. This textual name is used to display and identify the topic in lists such as those described below. A field 194 stores a hierarchy level for the topic. This established an ordering of the topics and further establishes topics and subtopics in a hierarchical arrangement that is useful in identifying a particular topic of interest. A topic is identified by a hierarchy level in the form of a numeric identifier. A topic with a hierarchy level of 1 is a major or top level topic. A topic with a hierarchy level of 1.1 is a subtopic which is the first subtopic to appear under topic 1. A topic with a hierarchy level of 1.2 is a subtopic that is the second topic to appear under the topic with hierarchy level 1. A topic with a hierarchy level of 2 is the second major topic and it appears after the first major topic with hierarchy level 1 in any list of the topics. This approach is followed for all topics so that all topics are positioned within a hierarchy of topics and subtopics and are ordered in a desired fashion.

Topics further have a category list in a field 196. The category list is a list of those categories which typically relate to the content used in the topic. The category list is typically a subset of all of the categories defined in the system. It will be appreciated that a sales report, which is an example of a first kind of topic, will not have the same categories of content as a performance review, which is an example of a second kind of topic. For this

reason, topics are associated with those categories that will be relevant to the content found in that topic.

Topic records further include a "used for" field 198. Field 198 includes a sequence of flags for identifying the context in which content for the topics are created.

An "advocated content" flag 199 indicates the content is created as advocated content for the organization. Advocated content is official positions of the organization using the knowledge management system. Advocated content is typically only created by trusted persons such as subject matter experts, and has the imprimatur of the organization operating the knowledge management system, and is intended for use by all members of the organization as official position of the organization.

A "donations" flag 200 indicates that the topic may be used for donations of knowledge. Anyone with access to the knowledge management system may donate knowledge using topics having the flag 200 set.

Knowledge donations may take the form of new information on a competitor product line, new information on customer needs, customer contacts or other information. Knowledge donations may also have comments on official positions on the organization and suggestions for changes therein. Knowledge donations are routed to subject matter experts for evaluation for determining

whether those knowledge donations should be assimilated into advocated content in the system.

A “disable” flag 201 indicates that the topic described by the topic record is not usable by any of the users. This flag is used whenever a  
5 topic is currently under definition and should not be used by users.

An “allow duplicates” flag 202 indicates whether the topic is of the sort in which duplicate content should be created. In many contexts, duplicate content should not be allowed. The allowed duplicates flag is used to indicate that duplicate content should not be permitted. As will be seen  
10 below, when content is being created, if there is existing content in the same topic with the same category values, and the topic does not allow duplicates as indicated by flag 202, then the contributor of the duplicate content is forced to collaborate with the contributor of the existing content to produce content reflecting their combined knowledge. In some situations, for example trip  
15 reports, it may be relevant to collect duplicate information having the same topic and same category values. In this situation, duplicates are allowed and collaboration is not forced. Definition of a topic includes deciding whether to allow or disallow duplicates.

A field 204 in a topic definition identifies the subject matter  
20 expert for the topic. The subject matter expert field 204 references a user information record for a person who is most expert on the topic. The expertise

of the subject matter expert for a topic does not relate to the content created using that topic, but rather the expertise of the subject matter expert relates to the format of the topic, and the manner in which information should be inserted into the fields or regions of the topic. It is a unique aspect of the present invention that subject matter experts relating to form, are separated from subject matter experts on content, i.e., experts on categories and category values, so that different kinds of expertise may be brought to bear to the issues of form and content, both of which relate to a single element of knowledge in the knowledge base.

A topic record 190 further includes a field 206 for storing control information used in controlling creation and modification of topic records. This information is crucial in obtaining an audit record of manner in which a topic has been created and changed over time. This information is collected through the Lotus Notes standard information management architecture, in the present embodiment of the invention which utilizes Lotus Notes. In other embodiments other auditing mechanisms could be utilized with similar effect.

A final field of a topic record 190 is a template field 208. The template field includes text or other data structures describing the format for the topic. In the case of a topic formatted as text, the template may include headings and potentially instructions for each section underneath the headings

for informing a user of the manner in which content should be inserted underneath the headings. The headings or fields of a topic may not necessarily be mandatory or restricted to those found in the template. In the present embodiment of the invention the template is a free form text document  
5 provided to the user for free form editing once a topic or category value has been selected by the user. However, in other embodiments, the headings within the topic and their content may be rigorously controlled in order to the make the headings inalterable and to require particular content under particular headings.

10 Referring now to Figs. 3B through 3E, screen displays in a Lotus Notes implementation of the present invention for managing topics can be discussed. As seen in Fig. 3B, in the left column 150 which forms a menu on the workbench screen, the topics menu item 210 has been selected. In response to the selecting the topics item, a window 212 is presented to the user  
15 showing the top level topics that are currently defined. The top level topics are identified by reference to the hierarchy level associated with each topic.

Referring now to Fig. 3C, when the user selects a top level topic in window 212, a second window 214 is presented to the user showing subtopics beneath the top level topic. The user is then able to select a subtopic  
20 in window 214 or select a top level topic in window 212. In either case, the

user may press one of the new, edit or delete menu items 216, 218 or 220, respectively, to create a new topic, edit an existing topic or delete a topic.

Referring now to Fig. 3D, the creation of a topic can be understood. When the user presses the new button 216 in the screen showing Fig. 3C, the screen shown in Fig. 3D is created to permit generation of the  
5      topic. In the screen shown in Fig. 3D, there is a field 192 for entering the name of the topic, a field 194 for storing hierarchical information for the topic, and a field 196 for identifying parent topics for the topic. A field 198 is used to set or clear the flags described above with reference to Fig. 3A. A field 204  
10     is used to identify subject matter expert for the topic in the manner described above. Finally, field 208 is used to store a template for the topic.

Referring to Fig. 3E, the information for a specific topic "competitive overview" is shown. Here it can be seen that "competitive overview" is a hierarchy level 5.1 topic, indicating that it is the first subtopic of  
15     the fifth top-level topic. Its parent topic is "competitive information and strategy". The categories relevant to the "competitive overview" topic which have been selected (by pushing button 222) include "competitor", "market segment" and "product".

As can be seen in area 198 of Fig. 3D, the "competitive  
20     overview" topic is used for advocated content and knowledge donations. Duplicates are not allowed.

As seen in area 204 of Fig. 3D, a subject matter expert has been identified for the "competitive overview" topic, and as seen in area 208, a template has been created. This template provides four headings for content produced in this topic. These headings are "company overview", "financial", "feature function", and "how to win". These fields define information of interest about a competitor.

Referring now to Fig. 4A, the record structure maps 109, 110 can be described. As noted above with reference to Fig. 1, a record structure map defines the structure of compatible or external database. Specifically, a record structure map provides a map between topics and categories defined internally of the knowledge management system, to fields of compatible or external databases. There are multiple record structure maps 109, 110, one for each database utilized the knowledge management system. Four record structure maps 109, 110 are shown in Fig. 4A, with one expanded to show the fields contained therein.

The fields of a record structure map 109, 110 include a text field 230 containing a short description for the record structure map and text field 232 containing a longer description of the record structure map. These text fields are used when the record structure map is being edited to identify the record structure map.



A field 234 identifies the kind of information in the database described by the record structure map. The database may be identified as advocated or recognized. An advocated database is one that contains official statements of company policy, for example official positions generated by trusted persons. A recognized database is one that contains data that may be useful but is not necessarily accepted as an official position of the organization utilizing the knowledge management system.

The subsequent fields are used to locate fields in the compatible or external database. Specifically a field 236 identifies the field of the database which identifies the author of content. A field 238 identifies a field in the database which identifies the title for the content. A field 240 identifies the field in the database containing an abstract for the content.

A field 242 identifies those topics of the knowledge management system which have relevance to the content found in the database. The database associated with the record structure map may not comply with the formats of the relevant topics identified in field 242, but may have similar content in a different format, and therefore should be retrieved when the topics identified in field 242 are retrieved. This is the purpose of the topic list in field 242.

Fields 244 in a record structure map identify categories of relevance to the data in the database associated with the record structure map.

Each field 244 identifies a category and identifies a field in the database to which that category is associated. Searches that are directed to particular categories thus will select records from the database using the field identified.

Record structure maps further include a selection formula in  
5 field 246. The selection formula is used to make an initial selection of content of relevance from the database. A selection formula permits only a subset of records in the database to be utilized in connection with the knowledge management system, so that irrelevant records in the database may be ignored by the knowledge management system.

10 A final field 248 in a record structure map identifies a manager for the database. This field identifies the servers where the database is located, and is used in directing a query to the database in an appropriate manner. It will be noted that the servers may be local Lotus Notes connected servers, Lotus Notes compatible servers at other locations such as client locations, or  
15 servers in other public areas such as connected via the Internet.

Referring now to Fig. 4B, the manner in which record structure maps are created and edited can be explained. As seen in Fig. 4B, in the left  
hand column 150, the databases menu item 260 has been selected. In response, in window 262 is displayed showing those databases accessible to  
20 the knowledge management system. Some of the databases identified in window 262 are internal databases, some are compatible databases and some

are external databases. For example, the KC donations and KC discussion databases are both internal databases. The Prevail Opportunity Manager database is a compatible database that uses Lotus Notes. The KM News via Yahoo! database is a compatible Lotus Notes database containing links to Internet content.

After a database is selected in window 262, the database may be edited by pressing the edit menu item 264. Further, a new record structure map for a new database may be added by pushing the new menu item 266. Record structure maps for databases may also be deleted by pressing the delete menu item 268.

Referring now to Fig. 4C, a record structure map is displayed when a new database is added or an existing compatible or external database is edited. In the screen of Fig. 4C, the record structure map for the "opportunity manager" compatible database is being edited. Fields 230 and 232, which store text descriptions of the database, can be seen. It can also be seen that the "opportunity manager" database is an advocated database as reflected in field 234. The author of content in this database, is identified by the "SalesRep" field, the title of content is found in the "OppName" field and the abstract for "opportunity manager" content is found in the "ViewSubjectOpp" field. The topics relevant to this database are shown in window 242. The only selected topic is the "opportunities" topic, indicating that information in the

"opportunity manager" database is relevant only to the opportunity topic in the knowledge management system.

As seen at 244, three categories have been mapped to the "opportunity manager" database. Specifically, the "competitor" category is mapped to the "competitors" field in the "opportunity manager" database. The "product" category is mapped to the "products" field and the "market\_segment" category is mapped to the "industry" field. As seen at 246, a selection formula is applied to the "opportunity manager" database to select only those records using the form "OPPORTUN". Field 248 indicates that the "opportunity manager" database can be accessed at the servers named prevail\_devcenter\_servers and prevail\_devcenter\_designers.

Referring now to Fig. 4D, when a user presses button 249 to edit the category mappings shown in area 244, a window 250 is presented. In this window a left column 150 identifies categories defined in the knowledge management system and a right column 254 identifies the names of fields in the database associated with the record structure map. The user may use a cursor to select a category in window 252 and a database field in window 254, and then push the add button 256 to add a category mapping which will be displayed in window 258. The remove button 260 may also be used to remove category mappings from those previously defined and shown in window 258.

Referring now to Fig. 4E, after a user has completed adjustment of category mapping using window 250 in Fig. 4D, and presses the OK button in window 250, then a second window 262 is displayed as shown in Fig. 4E.

In this window, fields of the database associated with the record structure map are shown in a window 264, and values for those fields to be inserted into those selection criteria are displayed in window 266. The user may select a field in window 264 and type in value in window 266 then press an operator button 268 to create a selection criterion. Selection criteria are shown in window 270. To identify the boolean relationships between the selection criteria, operator button 272 may be used to indicate whether an “or” or “and” or “not” operator should be applied to the selection criteria, and whether to insert parenthesis to group selection criteria in an appropriate manner.

Referring now to Fig. 5A, the information stored in a viewpoint definition used by viewpoint module 124 of Fig. 1 can be explained. There are multiple viewpoint definitions, one for each viewpoint used by users when interacting with the knowledge management system. Four such viewpoints 280 are shown in Fig. 5A, one of which is expanded to show the specific fields included in defining a viewpoint.

A viewpoint definition has a first text field 282 for providing a name for the viewpoint, a second text field 284 for providing a description of the viewpoint and a third text field 286 for providing a short description or

caption for the viewpoint. These three fields are used in identifying the viewpoint as will be seen below with reference to Figs. 5B through 5D.

Also included in a viewpoint definition is a category list 288, a database list 290 and a topic list 292. The categories in the category list 288  
5 are the categories relevant to the viewpoint, i.e. the categories which should be displayed to the user as default when the user utilizes the viewpoint to create a query or to donate content to the knowledge management system.

The database list in field 290 identifies the databases that are relevant to the viewpoint and should be the recipients of content created by the  
10 user.

The topic list in field 292 identifies the topics relevant to the viewpoint which should be presented to the user when using the viewpoint.

Referring now to Fig. 5B, the manner in which viewpoints are created and edited can be understood. As is seen in Fig. 5B, when the  
15 viewpoint menu item 300 is selected in the left column 150, a window 302 is generated identifying the current viewpoints that are defined by the knowledge management system. The user then presses one of the new, edit or delete menu items 304 to create a new viewpoint, edit an existing viewpoint or delete a viewpoint.

20 Referring now to Fig. 5C, when the user chooses to edit or create a new viewpoint, a viewpoint definition window 306 is presented. This

viewpoint definition window includes fields 282, 284 and 286 for providing a name, description and caption for the viewpoint. It further includes a field 288 for defining categories associated with the viewpoint. The user may press a button 308 to produce a pop down list of categories within which categories may be selected to be included in the list 288.

Window 306 further includes a field 290 identifying the databases relevant to the viewpoint. The user may press a button 310 to produce a list of databases within which additional databases may be selected.

Referring now to Fig. 5D, when the user selects a menu item 312 in window 206 shown in Fig. 5C, a lower portion 314 of window 306 is expanded as shown in Fig. 5D to permit configuration of topics for the viewpoint. In this lower portion 314 a first window 316 shows a list of major topics currently defined in the knowledge management system and a second window 318 shows those topics which are currently selected. Topics in window 316 may be added to the list in window 318 by pressing a button 320 when the topic is selected in window 316. Topics may be removed from the list in window 318 by pressing a button 322 when the topic is selected in window 318.

Referring now to Fig. 6A, the format of user records can be understood. User records are utilized in selecting viewpoints for a user and in creating content produced by a user. There are plurality of user records, three

user records 330 are shown in Fig. 6A, one of which is expanded to show the content of a user record.

The fields of a user record include fields 332, 334, 336, 338 and 340 for storing a user's name, address, city, state and zip code, respectively. The fields further include fields 342 and 344 for storing a user's telephone and facsimile number. The fields further include a field 346 for storing an email address for the user, and a field 348 for storing prior or legacy telephone numbers for the user. A field 350 identifies whether the user is a user of the knowledge management system, as opposed to a user of other unrelated Lotus Notes systems. Field 352 identifies the department of the user in field 354 identifies the role or title of the user.

Field 356 identifies particular information about the user relevant to the interaction with the knowledge management system. Specifically, field 356 identifies the manner in which the user is permitted to interact with the knowledge management system. Field 356 includes flags identifying each of the kinds of interaction the user may have with the knowledge management system.

An advocate flag 358 indicates that the user is a trusted party and able to create advocated content for insertion directly into the knowledge management system. When content is created by a user who is not an



advocate, this content is reviewed by subject matter experts as discussed below with reference to Fig. 9A.

Author flag 340 in field 356 indicates whether the user is an author, able to suggest content to an advocate for inclusion in the knowledge management system in the manner described below. This flag is used to allow  
5 only certain users to make donations.

Reader flag 362 in field 356 indicates whether the user is a reader able to read content in the knowledge management system. A reader can also donate content in the manner described below.

10 Flag 364 indicates whether the user is a subject matter expert charged with reviewing content or formats within the system.

Flag 366 indicates whether the user is an architect of this system, i.e. is permitted to modify system, more particularly, modify user settings and other database definitions.

15 Flag 368 indicates whether the user is a publisher permitted to place content in the knowledge management system.

Field 370 indicates whether the user is a reviewer charged with reviewing donated content for approval prior to addition to the knowledge management system.

Field 372 indicates that the user is a debugger charged with evaluating the knowledge management system for stability and correct operation.

A field 374 of the user record 330 indicates a feedback frequency that the user is to receive. This field can have three values of immediate, once per day, and never. The user will receive updates on content donations and other information, particularly feedback on content the user has authored, generated using the knowledge management system with the feedback frequency designated in fields 374.

A field 376 identifies a default viewpoint for a user. When the user searches for, discusses or donates content in the knowledge management system, the default viewpoint identified in field 376 is used by the user. It will be appreciated that the approach of associated each user with a default viewpoint allows the knowledge management system to have maximum flexibility to adapt to the needs of individual users. However, in a given organization it may be found that all users in particular organizations, for example all field sales personnel, may naturally have a common viewpoint. If this is the case, the knowledge management system may be configured to automatically assign a default viewpoint to users in certain parts of the organization, e.g., all persons with a given title are assigned the same default viewpoint. Such an approach can, of course, also be implemented manually

by assigning default viewpoints appropriately when users are defined, but an automatic assignment of viewpoint may offer beneficial efficiencies.

Field 378 identifies other default options as will be elaborated below.

5                   Field 380 identifies skills held by the user, such as programming languages known, product line familiarity and other skills of interest to the organization utilizing the knowledge management system.

Fields 382 and 384 provide additional information on the user such as an alternate email address for the user and personal information.

10                   Referring now to Fig. 6B, creation and use of user information in the workbench screen can be understood. As seen in Fig. 6B, when the "users" menu item 370 is selected in the left column 150, a window 372 is produced showing the names of users currently defined in the knowledge management system. The user may then press one of the new, edit and delete  
15                   menu items 374 to create a new user definition, edit an existing user definition or delete an existing user definition.

Referring now to Fig. 6C, when a user definition has been created or edited, a window 374 is displayed to facilitate viewing and editing the user information. This screen includes fields 332, 334, 336 and 340 for  
20                   identifying address information for the user. Further fields 342, 344 identify telephone and facsimile numbers of the user. The user's email address and

legacy telephone number are identified in fields 346 and 348. Also included are the flags in field 350, indicating whether the user is a knowledge management system user. Fields 352 and 354 indicate the department and role or title of the user, and fields 380, 382 and 384 identify skills and alternate email addresses and personal information for the user.

Field 356 defining roles for the user includes check boxes for each of the flags in field 356 defining the roles that are discussed above with reference to Fig. 6A. Field 374 includes three radio buttons for identifying the feedback notification to be provided to the user as discussed above. Field 376 indicates the default viewpoint of the user for discussing, donating or searching for content in the knowledge management system, as discussed above. Fields 378 identify other default options such as default search type (indicating the search methodology to be used by the user), preferred categories (indicating that categories that the user prefers to use in searches), and the default search options (such as how search results are to be sorted when presented to the user).

Referring now to Fig. 7A, the information stored in content information records 103A can be understood. There are a plurality of content information records as seen above with reference to Fig. 1. Five such content information records are shown in Fig. 7A, one of which is expanded to show the fields which are included in such a record.

The fields of the content information record include a plurality of fields 390 each of which stores a category and category value that has been associated with the content. Two such fields 390 are shown in Fig. 7A.

Content information records also include an index field 392  
5 storing indices for the content utilized by the database management system for locating the content. A further field 394 identifies a topic for the content, which was chosen when the content was created.

Various fields are used for reviewing the content. These functions are provided by Lotus Notes and are incorporated into the  
10 knowledge management system according to principles of the present invention. Field 396 stores various metrics for the content including statistics on the extent to which the content has been used and review statistics by users who have used the content and provided the review. Field 398 identifies reviewers who are to review the content and evaluate its merits. Field 400  
15 includes status creation and modification information that can be used to audit the generation and editing of the content. Security information in field 402 is used to control changes to the content and permit revision and access only to those parties who should have such access. A final field 404 specifies an expiration date for the content, which allows content that is time sensitive to  
20 be eliminated from the system automatically after its usefulness has expired,

and also allows the system to inform authors of pending expiration of content they have authored so that it can be updated.

Referring now to Fig. 7B, a template for a document is shown.

The headings for various sections of the document including “company  
5 overview,” “financials,” “feature function” and “how to win” can be seen in the template. The template has as yet not been filled out.

Utilizing Lotus Notes functionality, or the similar functions in other database management software, content information for a document may be retrieved and reviewed. In the Lotus Notes environment illustrated in Fig.  
10 7B, this is done by pressing the button 406 seen in Fig. 7B. When the content information is displayed, the screen shown in Fig. 7C is presented to the user. In this screen the category and value information in field 390 can be seen along with the indexing information 392 and the topic 394. Additional fields for document metrics 396, reviewers 398 and document status 400 also appear.  
15 These later fields are included in the standard Lotus Notes development package and are managed by Lotus Notes. Fig. 7C also illustrates an expiration date in field 404 associated with the document.

Referring to Fig. 7D, security information for content can be seen in a field 402. The content information includes a list of allowed editors  
20 for the content in an area 408, and a sequence of radio buttons in an area 410 indicating which users are allowed to access and view the content. Access

may be limited to internal access, in which case only those users in the organization which owns the knowledge management system may access the content. Access may be extended to a partner level, in which case user in partner organizations such as sister companies of the organization using the knowledge management system may have access to the content. Access may be further extended to customers in which case all potential or current customers of the organization may view the content. Access may also be made public, in which case any user having access to the knowledge management system may view the content. Access may also be limited to specific groups of individuals which permits a finer level of control and access to the content. All of these access functions are also provided through Lotus Notes standard development package.

In use, the knowledge management system described in the proceeding Figs. facilitates access to and creation and cataloging of knowledge. Referring now to Fig. 8, to access these functions, a top level menu screen presented to the users of the knowledge management system. At this menu screen the user may select from a number of different functions utilizing the knowledge management system.

These functions include dashboard functions used in configuring the knowledge management system, accessed through a button 500 on the main screen display.

These functions further include a search function accessed through button 510 on the main screen display and invoking the search functions described below with reference to the Figs. 10A through 10B.

A browse function accessed through button 512 is used to  
5 review records in an less formally structured manner.

An expert locator function accessed through button 514 is used to identify subject matter experts or other experts known to the knowledge management system as described below with reference to Figs. 12A through 12E.

10 An author support function accessed through button 516 on the main screen invokes functions to support the authoring of new content to insert into the knowledge management system, as described below with reference with Figs. 9A through 9E.

A knowledge donation function accessed through button 518 on  
15 the main screen and is used to donate content to the knowledge management system for subsequent review and inclusion in the knowledge management system as is also described below with reference to Figs. 9A through 9E.

A discussion function accessed through button 520 is used to initiate or join discussions on categories of interest utilizing the knowledge  
20 management system. The use of discussions is elaborated below with reference to Figs. 11A through 11C.



Finally, a profile function accessed through button 522 permitting direct access to user information records for individual users.

Referring now to Fig. 9A, use of the author support and knowledge donation functions can be discussed. These functions are invoked at the main screen by selecting the author support or donation buttons in step 530. In response, when author support is chosen, the user's profile is evaluated to determine whether the user is marked as an "author". If so, the screen shown in Fig. 9B is displayed to the user. This screen includes buttons for invoking various functions for authoring documents. (The "workbench" button is used to access the various screens discussed above for configuring the system. Note, however, that if the user's profile does not indicate that the user is a "architect", the user is not permitted to access the "workbench" functions.) In a first step in creating a new document, the author or donator selects create button 532 in Fig. 9B in step 534.

If the user is not marked as an "author", the user is prevented from authoring content, and may not enter the "author support" window shown in Fig. 9B. The user may, however, donate content by pushing the donate button 520 shown in Fig. 8, as seen at step 535 in Fig. 9A.

If the user presses the "create" button 532 in Fig. 9B, or the "donate" button 520 in Fig. 8, a window is displayed similar to window 536 shown in Fig. 9C. This window identifies topics and subtopics which may be

created by the user. The user then proceeds in step 538 to select a topic or subtopic from window 536. As can be seen in Fig. 9D, when a topic is selected in window 536, a list of subtopics is displayed in window 536 and a subtopic can be selected as shown in Fig. 9D.

5                   After a topic has been selected for the content to be created, the OK button in window 536 is pressed, completing the selection of the topic and subtopic. At this point, a window 540 is displayed as is shown in Fig. 9E. In this window, the user will select category values for those categories relevant to the topic (step 542 of Fig. 9A). As is noted above, topics are associated  
10                   with categories of relevance to the topic. These categories are displayed in window 540 to the user so that the user may chose category values for those categories relevant to the topic. In the example displayed in Fig. 9E, the relevant categories are "competitor", "market\_segment" and "product". The user can select one or more values for each of one or more categories.

15                   After the user completes selecting category values for the categories using window 540 of Fig. 9E, in step 546 (Fig. 9A) the knowledge management system evaluates the selected categories to determine whether there is an existing matching topic having the same category values. If so, then in step 548, the topic record for the topic is evaluated to determine  
20                   whether duplicates are disallowed, by referencing flag 202 in the topic record. If duplicates are disallowed, then in step 550, the existing matching topic is

displayed to the user so that the user may use the existing matching topic and edit or comment upon it.

If there is no existing matching topic with the same category values in step 546, or duplicates are not disallowed, then in step 552, the  
5 template stored in the topic record for the selected topic is used to create a new document in the form generally seen in Fig. 7B. The new document is filled with appropriate document properties to identify the category selected by the user, the user's name, indexing values and other information that can be generated based on the topic and category values. Thereafter, in step 554 the  
10 new document is displayed to the user for editing.

After an existing or new document has been displayed to the user for editing and the user wishes to save the content created, in step 556 it is determined whether the user is donating knowledge or is an author permitted to author new content for immediately inclusion in the knowledge  
15 management system. If the new content is a donation, then in step 558 the new content produced by the user is stored separately from approved content so that it may be reviewed by the subject matter experts for the topic and category or category value associated with the content. Electronic messages are delivered to the subject matter experts for the topic, category and/or  
20 category values selected for the new content. The subject matter experts will then proceed to review the document. After this review, if the content is

approved, it will be moved to join other content in the knowledge management system that is accessible to all users. In the present embodiment, this is done by a subject matter expert, by cutting and pasting the content to a newly-authored document. In other embodiments the migration of content to the  
5 knowledge management system may be automated in an appropriate fashion.

If the new content was created using the author support functions, the user is able to add content directly to the knowledge management system; in this case, in step 562, the new content created by the user is stored in the database for immediate viewing by others via the  
10 knowledge management system.

If the new content was created using the donate function, before the new content is included in the knowledge management system, in step 558 the new content is stored separately for review, as discussed above. If, however,

15 Referring now to Fig. 10A, the process for searching for content can be understood. To initiate this process, in step 570 a search button 510 is selected in the main menu of Fig. 8. Subsequent to this step, in step 572 the user's information record is used to select a default viewpoint for the user's search. In step 574, the search window shown in Fig. 10B is displayed  
20 using the user's default viewpoint. In the search window the currently selected viewpoint is identified in field 576. The currently selected viewpoint is also

used to derive search parameters in fields 578 such as the sorting order,  
number of documents to return, whether exact word matches are required and  
whether a thesaurus will be used to look up synonyms search terms. The  
topics for the search in area 580 and the categories to search in area 582 are  
5 also chosen using the viewpoint selected in areas 576.

In step 584 of Fig. 10A, the user first confirms the viewpoint or  
selects a new viewpoint for searching. Since the viewpoint defines many of  
the other search parameters, the user will select a viewpoint prior to defining  
other search parameters. This process permits most of or all of the search  
10 parameters to be selected automatically based on the viewpoint selected for the  
search.

After selecting an appropriate viewpoint, the user reviews the  
search parameters in areas 578, 580 and 582 to confirm the searches is as  
desired. Specifically in step 586 of Fig. 10A, the user may select different  
15 topics for searching, chose different categories for searching or change the  
search parameters in area 578. After this process is done, then in step 588 the  
user selects one specific topic or subtopic to search and in step 590, the user  
selects one or many category values for the search. When the search has been  
completely defined, in step 592, the user executes the search by pressing  
20 button 594 shown in Fig. 10B. The search is then performed by selecting only  
that content matching the topics and categories that are identified by the user.

Referring now to Fig. 11A, the process for initiating or joining a discussion can be understood. As the first step, the discussion button 520 on the main screen (Fig. 8) is selected in step 600. This causes the screen shown in Fig. 11B to be displayed. In a window 602 of this screen, the user is invited to select categories for the discussion being created or joined. The categories that are presented in window 602 are selected based upon a viewpoint identified in a pull down box 604. The user may change the viewpoint by pulling down a menu of additional viewpoints in box 604. This permits the user to choose a viewpoint for the discussion in step 606 in Fig. 11A. Then, in step 608 of Fig. 11A, the user selects categories values from those categories which are displayed in window 602.

After the user has chosen the category values for the discussion that has been created or joined, the knowledge management system in step 610 evaluates all of the existing discussion to determine if there is an existing discussion with matching category values. If so, then in step 512, the existing discussion is displayed to the user so that the user may join or review the existing discussion. If there is no existing discussion with the same category values, then in step 614 a discussion template may be used to create and display a new discussion on those category values.

It will be appreciated that the foregoing approach to managing discussions is far more flexible than traditional newsgroup discussions.

Specifically, because a discussion is associated with potentially multiple category values when the discussion is initiated, the discussion can be found by users searching for any one of those category values. Thus, rather than forcing all discussions to be rigidly associated with a single theme, as is done in newsgroups, discussions managed in accordance with principles of the present invention are fluid and can be found and joined by users based on various different themes that are pertinent to the discussion.

The display of a discussion is illustrated in Fig. 11C. The discussion is arranged in threads, as is used in other discussion formats. Discussions may be viewed by author, date or subject matter.

Referring to Fig. 12A, expert locator functions of the knowledge management system can be explained. Expert locator functions are initiated in step 620 by pressing the expert locator button 514 in the main screen of Fig. 8. This causes display of the screen shown in Fig. 12B. This screen includes radio buttons 622 and 624 that allow the user to locate an expert using topics or locator and expert using categories. In Fig. 12B, the radio button 622 has been selected, to locate subject matter by topic. When this is done, window 626 displays topics currently defined in the knowledge management system. When a topic is selected in this window 626, the associated subject matter expert is identified in area 628. By pushing the profile button 630, a profile derived from the user information for the subject

matter expert can be displayed for the user. In this way in step 632 of Fig. 12A, a subject matter expert may be located using topics.

As seen in Fig. 12C, when radio button 624 is invoked, a subject matter expert is located by category. Specifically, when radio button 624 is invoked a list of all of the defined categories in the knowledge management system are listed in area 632. The user may then select category values of interest and depress the find button 634. Doing so causes the knowledge management system to identify subject matter experts having expertise in the selected categories. In this way, the subject matter expert may be located using category values of interest in step 636 of Fig. 12A.

Referring to Fig. 12D, by depressing the authors button 638, an author of content may be located. This approach to finding an expert is an alternative to locating designated subject matter experts. When button 638 is pressed, the user is allowed to choose a topic or category value. Then, a window 640 is displayed listing all of those individuals in the knowledge management center who written content relating to the selected topic or category value. By selecting one of these authors, a profile of the author can be displayed. In this way, a subject matter expert can be located by locating authors in step 642 of Fig. 12A.

A final approach to locating an expert is shown in Fig. 12E. In this approach, the profile button 644 is depressed producing windows in areas



646, 648, and 650 in which the title and/or skill set and/or keywords of a  
experience description for the desired expert can be entered. All individuals  
matching these criteria can be found by pressing find button 652. In this  
manner an expert may be located by identifying title, skill sets, or other user  
5 profile items in step 654 of Fig. 12A.

After locating an expert in any of the above manners, the expert  
profile is displayed allowing the user to initiate an email or chat with the  
located expert, as identified in step 656 in Fig. 12A.

Referring now to Appendix A attached to this patent  
10 application, it is an aspect of the present invention to configure a knowledge  
management system in a manner that is appropriate for the content produced  
and used by a given organization. Appendix A is a questionnaire that can be  
used to determine the knowledge management needs of an organization, and in  
particular to identify topics and categories and user definitions for an  
15 organization to make best use of a knowledge management system in  
accordance with the present invention. The present invention thus  
encompasses the method of collecting information on the personnel,  
management structures, activities and content created and used by an  
organization, and then configuring topics, categories and other data structures  
20 of the form described above to fit the personnel, management structures,  
activities and content created and used by the organization.

While the present invention has been illustrated by a description of various embodiments and while these embodiments have been described in considerable detail, it is not the intention of the applicants to restrict or in any way limit the scope of the appended claims to such detail.

5 Additional advantages and modifications will readily appear to those skilled in the art.

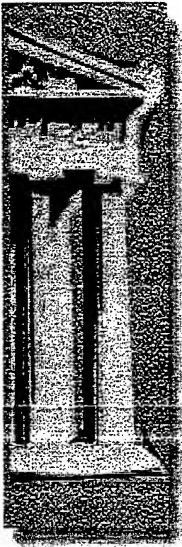
For example, while in the preceding description content items are created and retrieved in units of the same size, this need not be the case. For example, a single document or file created by a user may be broken into  
10 multiple parts, each of which is a content item, and categories and category values and/or topics may be assigned to each of the multiple content items which form the parts, so that individual content items may be retrieved by a user rather than all of the content items assembled together. "Content item" thus refers to any separately retrievable item of content, and need not be a  
15 complete document or file that may contain multiple content items.

The invention in its broader aspects is therefore not limited to the specific details, representative apparatus and method, and illustrative example shown and described. Accordingly, departures may be made from such details without departing from the spirit or scope of applicant's general  
20 inventive concept.

What is claimed is:



**SYNERGISTICS** INC.  
a collaborative computing company



# **Prevail Knowledge Center™ Project Profiler**

May 28, 1999  
Contact: Denise Holz

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## Overview

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Synergistics, Inc., an IBM Partner in Development and Lotus Alliance Level Business Partner, is pleased to provide this Prevail Knowledge Center™ Project Profiler, a comprehensive survey designed to guide organizations in assessing the impact and scope of deploying a Knowledge Management solution to further company revenue objectives.

By completing this document you should be able to:

- Assess your organization's high-level knowledge imperative
- Identify high-impact areas of focus for Prevail Knowledge Center™ deliverables
- Build an explicit process for Knowledge Management in the organization — in support of, and associated with, fundamental business processes
- Determine points of leverage in your organization's technology infrastructure
- Understand potential leadership and cultural enablers/inhibitors, and build action plans for resolving issues
- Establish key roles and responsibilities for successful Prevail Knowledge Center™ deployment and adoption
- Plan a series of deployments which will incrementally bring the organization closer to its high-level knowledge imperative

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## Strategic Goals

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1. What must your Prevail Knowledge Center™ project accomplish to be successful — what is your primary business need or problem?

2. To what extent do you want to improve your organization's ability to read, browse, study, and apprentice?

3. To what extent do you want to improve your organization's ability to reuse, discover, optimize, and mine?

4. To what extent do you want to improve your organization's ability to problem-solve, strategize, coordinate, and mass customize?

5. To what extent do you want to improve your organization's ability to chat, brainstorm, conference, and network?

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### The Knowledge Management Project

---

1. Are there currently any Knowledge Management initiatives underway at your organization? If so, please describe.

2. Have any Knowledge Management projects or roles been initiated, then discontinued in your organization?

3. What return do you expect from a Knowledge Management deployment? Has funding been allocated for the project?

4. Who in your organization will be working on the project from a definition perspective? What is the level of decision-making authority of the team? Is there a committed executive sponsor?

5. What are your timeframe expectations/constraints?

---

### Infrastructure

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1. Describe your current technology infrastructure for document or knowledge management.

2. Provide a high-level perspective on the media (paper, CD-ROM, hard drive, Web/intranet, email, Lotus Notes, etc.) used most often to share knowledge in your organization.

3. To what extent do your operational systems support decision support – management reporting for more-informed business decisions?

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**People**

---

1. How many people will be using the Knowledge Management product? In what functional area(s) – sales, marketing, human resources, R&D, engineering & development, manufacturing, logistics, etc.?

2. Describe the Knowledge Culture in your organization. Are employees rewarded for publishing and sharing information with others? Are subject matter experts recognized as such? Are problems discussed openly and "lessons learned" from mistakes shared? Will your current culture support or undermine the proposed project?

3. Do you expect establish/augment specific knowledge roles which will continue beyond the completion of the Knowledge Management project?

4. How do sales people become knowledgeable now? (about products, competition, market, sales strategy, customer needs, etc.)

---

**Process**

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1. Describe your current process(es) for distributing information to receivers.

2. Describe how knowledge is gathered, stored and categorized in your organization.

3. Describe how ideas, examples, customer issues, etc. are communicated from the "field" to the "home office" for escalation and action.

4. Are the organization's measures based purely on data from operational systems, or are there also metrics for process improvements, innovation, competency, employee productivity, and customer responsiveness? What new behaviors must your leaders exhibit to communicate a shift from valuing individual to collective knowledge?

---

**Information**

1. Provide some examples of mission-critical that is developed in the "home office" that must be more-efficiently distributed to the "field"

2. Provide some examples of mission-critical that is developed in the "field" that must be more-efficiently shared among employees



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**Questions for Information Receivers**

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1. What specific topics or types of information do you need to do your job? (i.e. case studies, competitor information, research documents, etc.) How would you organize these topics?

2. How often is the information you need not readily available to you and why?

3. How often is the information you need available but obsolete?

4. Where do you go now for that information?

5. Is there a format for the information that you prefer? (i.e. MSWord, Web pages, Lotus notes, PowerPoint, Newsletters, etc.)

6. How do you search for company-internal information?

7. How do you search for external information?

8. Who do you call for help when you can't find information you need?

9. Do you consistently use any Web sites to help you do your job? Please list some of the specific Internet sites (i.e. [www.yahoo.com](http://www.yahoo.com), etc).

10. Where is the "official" company list of Products? Competitors? Industries? Other?

11. Can you give an example of a time that you would have been more effective or successful if you had the right info at the right time?

12. Please list five or more subject matter experts that you deal with on a regular basis.

13. In what areas are you considered a knowledge expert? (Don't be shy)

14. How do you differentiate knowledge from information? (In your own words)

15. Does your organization encourage knowledge acquisition? (Knowledge acquisition is the exercise to attain knowledge through training, mentoring, sharing, reading, etc.)

16. How do you acquire knowledge?

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### Questions for Information Providers

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1. How do you share what you know with others?

2. When you get calls for information today, what are the requesters typically asking for?

3. To what extent do you share knowledge with others outside of your geographical area?

4. Please provide an inventory of the information you share:

Topic	
Frequency of Update (current and recommended)	
Frequency of Distribution  (current and recommended)	
Method of Distribution (current and recommended)	
Method of Organization/Categorization (current and recommended)	
Physical Location (current and recommended)	
Security Limitations/Rules (current and recommended)	

Claims

- 1                           1. A method of authoring a content item in a knowledge  
2                           management system, the method comprising:  
3                                 (a) receiving user input from a user that specifies an  
4                                 item format with which to associate a new content item;  
5                                 (b) presenting to the user a subset of categories from a  
6                                 plurality of categories based upon the item format specified by  
7                                 the user;  
8                                 (c) receiving user input from the user that specifies a  
9                                 value for a category in the subset of categories with which to  
10                                associate the new content item; and  
11                                (d) adding the new content item to the knowledge  
12                                management system with the specified item format and the  
13                                specified category value associated with the new content item.
- 1                           2. The method of claim 1, wherein receiving user input  
2                           specifying the item format, presenting the subset of categories, receiving user  
3                           input specifying the category value and adding the new content item are  
4                           performed sequentially.
- 1                           3. The method of claim 1, further comprising:

- 2 (a) determining, prior to adding the new content item,  
3 whether an existing content item in the knowledge management  
4 system matches the item format and category value specified  
5 by the user; and  
6 (b) if so, displaying such existing content item to the  
7 user for editing in lieu of adding the new content item.

- 1 4. The method of claim 1, further comprising, prior to adding  
2 the new content item, obtaining authorization from first and second  
3 responsible entities, the first responsible entity associated with the item format  
4 with which to associate the new content item, and the second responsible  
5 entity associated with a category with which to associate the new content item,  
6 and wherein adding the new content item is performed after authorization is  
7 obtained from the first and second responsible entities.

- 1 5. The method of claim 1, further comprising:  
2 (a) displaying to the user a document template  
3 associated with the item format with which to associate the new  
4 content item; and  
5 (b) creating the new content item using the document  
6 template.

1                   6. The method of claim 1, wherein the item format is selected  
2                   among a plurality of topics organized into a hierarchical arrangement, each  
3                   topic classified based upon the type of content item with which to associate  
4                   such topic.

5  
6                   7. The method of claim 1, wherein receiving user input from  
7                   the user that specifies a value for a category includes receiving user input that  
8                   specifies a value for each category in the subset of categories.

1                   8. The method of claim 1, wherein receiving user input from  
2                   the user that specifies a value for a category includes receiving user input that  
3                   specifies multiple values for the category.

- 1                   9. A knowledge management system, comprising:
- 2                   (a) a memory; and
- 3                   (b) a program resident in the memory, the program
- 4                   configured to receive user input from a user that specifies an
- 5                   item format with which to associate a new content item, present
- 6                   to the user a subset of categories from a plurality of categories
- 7                   based upon the item format specified by the user, receive user
- 8                   input from the user that specifies a value for a category in the
- 9                   subset of categories with which to associate the new content
- 10                  item, and add the new content item to the knowledge
- 11                  management system with the specified item format and the
- 12                  specified category value associated with the new content item.

- 1                   10. A program product, comprising:
- 2                   (a) a program configured to receive user input from a
- 3                   user that specifies an item format with which to associate a new
- 4                   content item, present to the user a subset of categories from a
- 5                   plurality of categories based upon the item format specified by
- 6                   the user, receive user input from the user that specifies a value
- 7                   for a category in the subset of categories with which to
- 8                   associate the new content item, and add the new content item to
- 9                   the knowledge management system with the specified item
- 10                  format and the specified category value associated with the new
- 11                  content item; and
- 12                  (b) a signal bearing medium bearing the program.

- 1                   11. The program product of claim 10, wherein the signal
- 2                   bearing medium includes at least one of a recordable medium and a
- 3                   transmission type medium.



- 1                    12. A method of authoring a content item in a knowledge  
2                    management system, wherein the knowledge management system includes a  
3                    plurality of existing content items, with each content item associated with an  
4                    item format and a value of a category, the method comprising:  
5                    (a) receiving user input from a user that specifies an  
6                    item format and a value of a category with which to associate a  
7                    new content item;  
8                    (b) determining whether an existing content item in the  
9                    knowledge management system matches the item format and  
10                   category value specified by the user;  
11                   (c) if an existing content item is determined to match,  
12                   displaying such existing content item to the user for editing in  
13                   lieu of creating a new content item.

- 1                    13. The method of claim 12, further comprising creating the  
2                    new content item if no existing content item is determined to match.

- 1                   14. A knowledge management system, comprising:
- 2                   (a) a memory;
- 3                   (b) a plurality of existing content items resident in the
- 4                   memory, with each content item associated with an item format
- 5                   and a value of a category; and
- 6                   (c) a program resident in the memory, the program
- 7                   configured to receive user input from a user that specifies an
- 8                   item format and a value of a category with which to associate a
- 9                   new content item, determine whether an existing content item
- 10                  matches the item format and category value specified by the
- 11                  user, and display such existing content item to the user for
- 12                  editing in lieu of creating a new content item if an existing
- 13                  content item is determined to match.

- 1                   15. A program product, comprising:
- 2                   (a) a program configured to receive user input from a
- 3                   user that specifies an item format and a value of a category with
- 4                   which to associate a new content item, search a plurality of
- 5                   existing content items in a knowledge management system,
- 6                   each of which associated with an item format and a value of a
- 7                   category, to determine whether an existing content item
- 8                   matches the item format and category value specified by the
- 9                   user, and display such existing content item to the user for
- 10                  editing in lieu of creating a new content item if an existing
- 11                  content item is determined to match; and
- 12                  (b) a signal bearing medium bearing the program.

- 1                   16. A method of authoring a content item in a knowledge  
2           management system, the method comprising:
- 3                   (a) receiving a donated content item to the knowledge  
4           management system, with the donated content item associated  
5           with an item format and a category that classifies at least a  
6           portion of the content of the content item;
- 7                   (b) forwarding the donated content item to a first  
8           responsible entity associated with the item format associated  
9           with the donated content item to obtain authorization  
10          therefrom;
- 11                  (c) forwarding the donated content item to a second  
12          responsible entity associated with the category associated with  
13          the donated content item to obtain authorization therefrom; and
- 14                  (d) accepting the donated content item into the  
15          knowledge management system after obtaining authorization  
16          from both of the first and second responsible entities.

- 1                   17. The method of claim 16, wherein receiving the donated  
2           content item includes marking the donated content item as unadvocated and  
3           wherein accepting the donated content item incorporating the donated content  
4           item in a content item marked as advocated.

1                   18. The method of claim 16, wherein receiving the donated  
2                   content item includes storing a copy of the donated content item in an  
3                   unadvocated database, and wherein accepting the donated content item  
4                   includes storing a copy of the donated content item in an advocated database.

1                   19. The method of claim 18, wherein accepting the donated  
2                   content item further includes removing the copy of the donated content item  
3                   from the unadvocated database.

1                   20. The method of claim 16, wherein forwarding the donated  
2                   content item to the first responsible entity includes notifying the first  
3                   responsible entity of the donated content item via an electronic message.

1                   21. The method of claim 16, wherein the donated content item  
2                   is further associated with a value of the category that further classifies at least  
3                   a portion of the content of the content item, wherein the method further  
4                   includes forwarding the donated content item to a third responsible entity  
5                   associated with the value of the category associated with the donated content  
6                   item to obtain authorization therefrom, and wherein accepting the donated

7       content item is performed only after obtaining authorization from the third  
8       responsible entity.

1                   22. The method of claim 16, wherein the first and second  
2       responsible entities are different users of the knowledge management system.

1                   23. The method of claim 16, further comprising locating a  
2       responsible entity among a plurality of responsible entities by performing a  
3       search having a search criteria that specifies at least one of an item format and  
4       a category.

1                   24. A knowledge management system, comprising:  
2                   (a) a memory; and  
3                   (b) a program resident in the memory, the program  
4                   configured to receive a donated content item, with the content  
5                   item associated with an item format and a category that  
6                   classifies at least a portion of the content of the content item,  
7                   forward the content item to a first responsible entity associated  
8                   with the item format associated with the donated content item  
9                   to obtain authorization therefrom, forward the content item to a  
10                  second responsible entity associated with the category  
11                  associated with the donated content item to obtain authorization  
12                  therefrom, and accept the donated content item after obtaining  
13                  authorization from both of the first and second responsible  
14                  entities.

- 1                   25. A program product, comprising:
- 2                   (a) a program resident in the memory, the program
- 3                   configured to receive a donated content item, with the content
- 4                   item associated with an item format and a category that
- 5                   classifies at least a portion of the content of the content item,
- 6                   forward the content item to a first responsible entity associated
- 7                   with the item format associated with the donated content item
- 8                   to obtain authorization therefrom, forward the content item to a
- 9                   second responsible entity associated with the category
- 10                  associated with the donated content item to obtain authorization
- 11                  therefrom, and accept the donated content item after obtaining
- 12                  authorization from both of the first and second responsible
- 13                  entities; and
- 14                  (b) a signal bearing medium bearing the program.



1                   26. A method of creating a knowledge management system for  
2                   an organization, the knowledge management system for use in storing a  
3                   plurality of content items, the method comprising:

4                               (a) collecting information from an organization relating  
5                               to both the types of content items to be stored and the  
6                               taxonomy of information in the knowledge management  
7                               system;

8                               (b) defining a plurality of item formats representative  
9                               of the types of content items to be stored in the knowledge  
10                              management system;

11                             (c) defining a plurality of categories representative of  
12                             the taxonomy of information to be stored in the knowledge  
13                             management system; and

14                             (d) associating each of a plurality of content items with  
15                             at least one item format and at least one category.

1                   27. The method of claim 26, further comprising linking an  
2                   existing database to the knowledge management system, including mapping  
3                   fields in the existing database to compatible categories in the knowledge  
4                   management system.

1                   28. The method of claim 26, further comprising:  
2                   (a) defining a plurality of values for each of the  
3                   plurality of categories; and  
4                   (b) associating each of the plurality of content items  
5                   with at least one value for each category associated therewith.

1                   29. The method of claim 28, wherein the pluralities of item  
2                   formats, categories and values define a set of search parameters usable in  
3                   generating a search query for the knowledge management system, the method  
4                   further comprising generating a user record for a user of the knowledge  
5                   management system, including associating a search filter with the user record,  
6                   the search filter defining a subset of the set of search parameters accessible by  
7                   the user when generating a search query.

1                   30. The method of claim 26, further comprising:  
2                   (a) defining a responsible entity for each item format  
3                   and each category; and  
4                   (b) prior to storing a content item in the knowledge  
5                   management system, obtaining authorization from the  
6                   responsible entities associated with each of the item format and

7 category for the content item to be stored in the knowledge  
8 management system.

1                   31. A method of searching a database accessible via a search  
2                   query generated using a set of search term lists, each search term list including  
3                   a discrete number of search terms, the method comprising:

4                               (a) selecting among a plurality of search filters based  
5                               upon the identity of a user attempting to access the database,  
6                               each search filter defining a subset of search term lists from the  
7                               set of search term lists;

8                               (b) filtering user input from the user through the  
9                               selected search filter to generate a search query for the user;  
10                              and

11                             (c) accessing the database using the search query.

1                   32. The method of claim 31, wherein each of the plurality of  
2                   search filters is associated with a user type, and wherein selecting among the  
3                   plurality of search filters based upon the identity of the user includes:

4                               (a) determining a user type for the user; and

5                               (b) selecting the search filter among the plurality of  
6                               search filters that is associated with the user type for the user.

1                   33. The method of claim 31, wherein filtering user input  
2 includes displaying only search term lists from the subset of search term lists  
3 to the user.

1                   34. The method of claim 31, wherein the selected search filter  
2 is a default search filter associated with the user, the method further  
3 comprising selecting an alternate search filter among the plurality of search  
4 filters in response to user input.

1                   35. The method of claim 31, wherein the database includes a  
2 plurality of content items, wherein the set of search term lists includes a list of  
3 item formats, wherein each of the plurality of content items is associated with  
4 at least one of the item formats in the list of item formats, and wherein  
5 filtering user input includes inhibiting selection of a item format from the list  
6 of item formats for the search query.

1                   36. The method of claim 35, wherein the set of search term  
2 lists further includes a plurality of category lists, each category list having a  
3 plurality of values for one of a plurality of categories, wherein each of the  
4 plurality of content items is associated with at least one value of at least one of  
5 the plurality of categories, and wherein filtering user input includes inhibiting

6        selection of a value from at least one of the plurality of category lists for the  
7        search query.

1                    37. The method of claim 36, wherein filtering user input  
2        includes inhibiting selection of any value from at least one of the plurality of  
3        category lists for the search query.

1                    38. The method of claim 31, wherein generating the search  
2        query includes selecting first and second search terms from first and second  
3        search term lists, respectively.

- 1                   39. An apparatus, comprising:
- 2                   (a) a memory;
- 3                   (b) a database resident in the memory, the database
- 4                   accessible via a search query generated using a set of search
- 5                   term lists, each search term list including a discrete number of
- 6                   search terms; and
- 7                   (c) a program resident in the memory, the program
- 8                   configured to select among a plurality of search filters based
- 9                   upon the identity of a user attempting to access the database,
- 10                  each search filter defining a subset of search term lists from the
- 11                  set of search term lists, filter user input from the user through
- 12                  the selected search filter to generate a search query for the user,
- 13                  and access the database using the search query.

- 1                   40. A program product, comprising:
- 2                   (c) a program configured to select among a plurality of
- 3                   search filters based upon the identity of a user attempting to
- 4                   access a database, each search filter defining a subset of search
- 5                   term lists from a set of search term lists for use in generating a
- 6                   search query for the database, and each search term list
- 7                   including a discrete number of search terms, the program
- 8                   further configured to filter user input from the user through the
- 9                   selected search filter to generate a search query for the user, and
- 10                  access the database using the search query; and
- 11                  (b) a signal bearing medium bearing the program.



1                   41. A method of accessing a discussion thread database, the  
2       discussion thread database including a plurality of discussion threads, each  
3       associated with a value for at least one category that classifies the content of  
4       such discussion thread, each category including a plurality of discrete values,  
5       the method comprising:

6                   (a) receiving user input from a user that specifies first  
7                   and second values for first and second categories, respectively;

8                   (b) determining whether a discussion thread among the  
9                   plurality of discussion threads matches the first and second  
10                  values of the first and second categories; and

11                  (c) if a discussion thread matches, displaying such  
12                  matching discussion thread to the user.

1                   42. The method of claim 41, further comprising, if no  
2       discussion thread matches, automatically creating a new discussion thread  
3       associated with the first and second values for the first and second categories.

1                   43. The method of claim 42, further comprising posting a  
2       message to the new discussion thread in response to user input.

1                   44. The method of claim 41, further comprising posting a  
2                   message to the matching discussion thread in response to user input.

1                   45. The method of claim 41, wherein such matching discussion  
2                   thread is further associated with a third value for a third category, the method  
3                   further comprising:

4                   (a) receiving user input from a user that specifies any  
5                   combination of the first, second and third values of the first,  
6                   second and third categories, respectively; and

7                   (b) displaying such matching discussion thread to the  
8                   user irrespective of the combination specified by the user.

- 1                   46. An apparatus, comprising:
- 2                   (a) a memory;
- 3                   (b) a discussion thread database resident in the
- 4                   memory, the discussion thread database including a plurality of
- 5                   discussion threads, each associated with a value for at least one
- 6                   category that classifies the content of such discussion thread,
- 7                   each category including a plurality of discrete values; and
- 8                   (c) a program resident in the memory, the program
- 9                   configured to receive user input from a user that specifies first
- 10                  and second values for first and second categories, respectively,
- 11                  determine whether a discussion thread among the plurality of
- 12                  discussion threads matches the first and second values of the
- 13                  first and second categories, and, if a discussion thread matches,
- 14                  display such matching discussion thread to the user.

- 1                   47. A program product, comprising:
- 2                   (a) a program configured to receive user input from a
- 3                   user that specifies first and second values for first and second
- 4                   categories, respectively, search a discussion database including
- 5                   a plurality of discussion threads, each of which associated with
- 6                   a value for at least one category that classifies the content of
- 7                   such discussion thread, and each category including a plurality
- 8                   of discrete values, to determine whether a discussion thread
- 9                   among the plurality of discussion threads matches the first and
- 10                  second values of the first and second categories, and, if a
- 11                  discussion thread matches, display such matching discussion
- 12                  thread to the user; and
- 13                  (b) a signal bearing medium bearing the program.

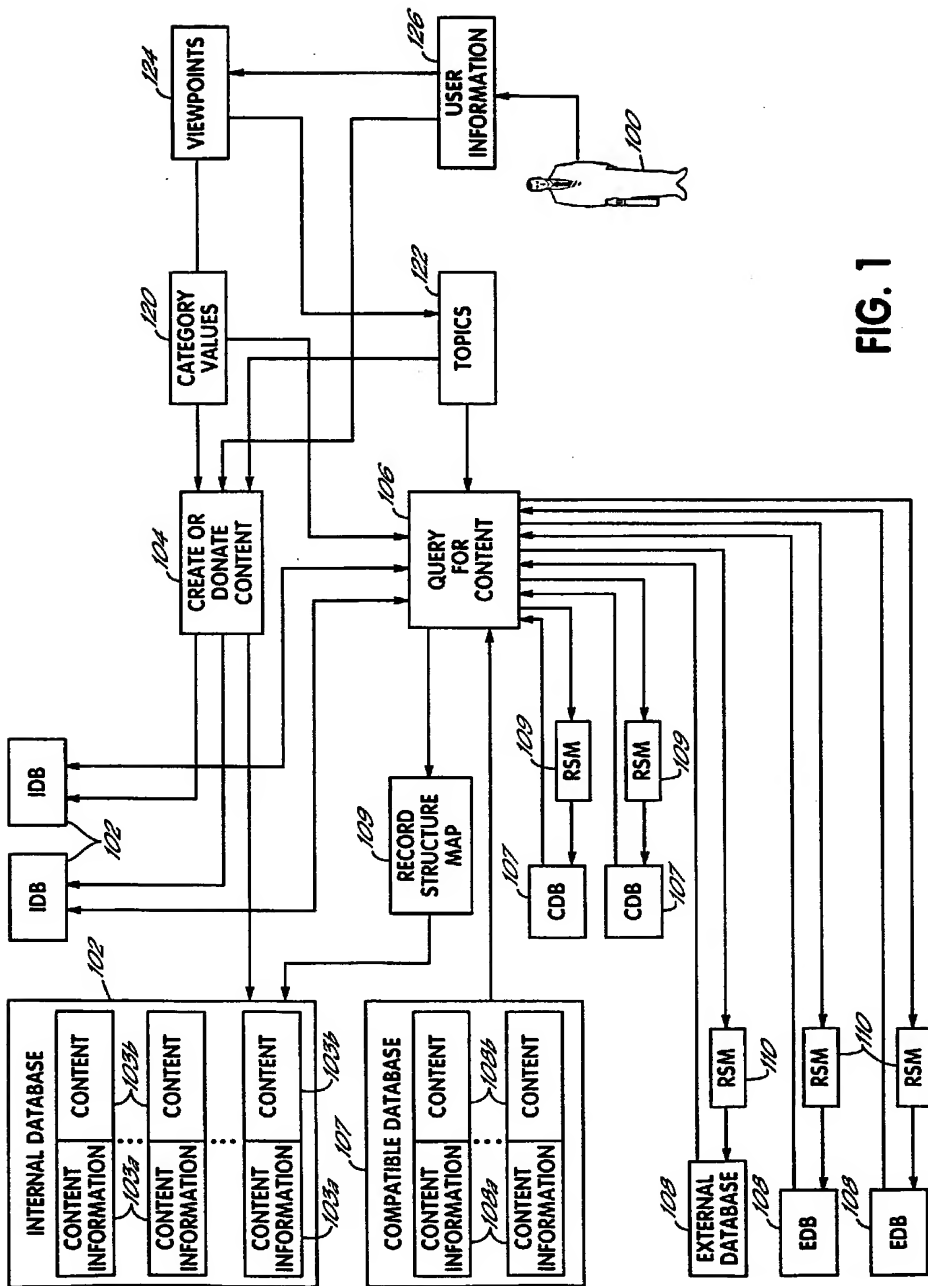


FIG. 1

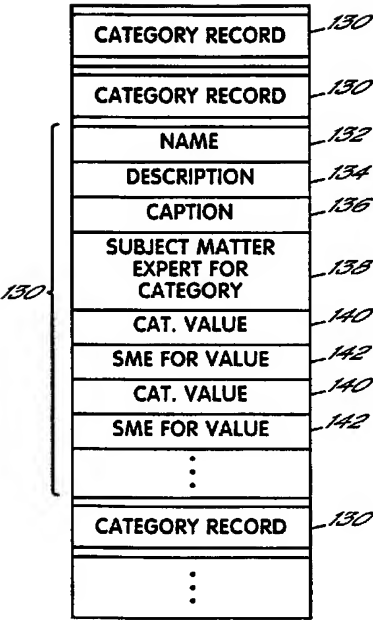


FIG. 2A

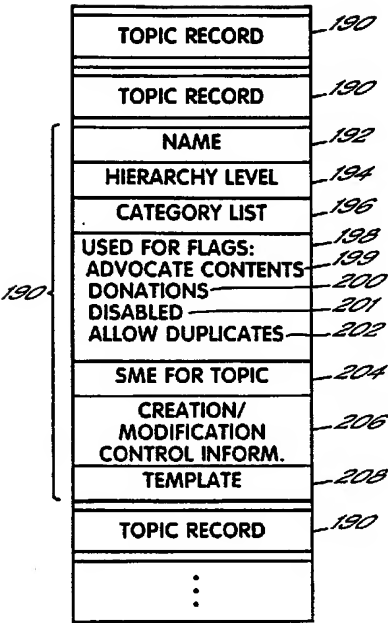


FIG. 3A

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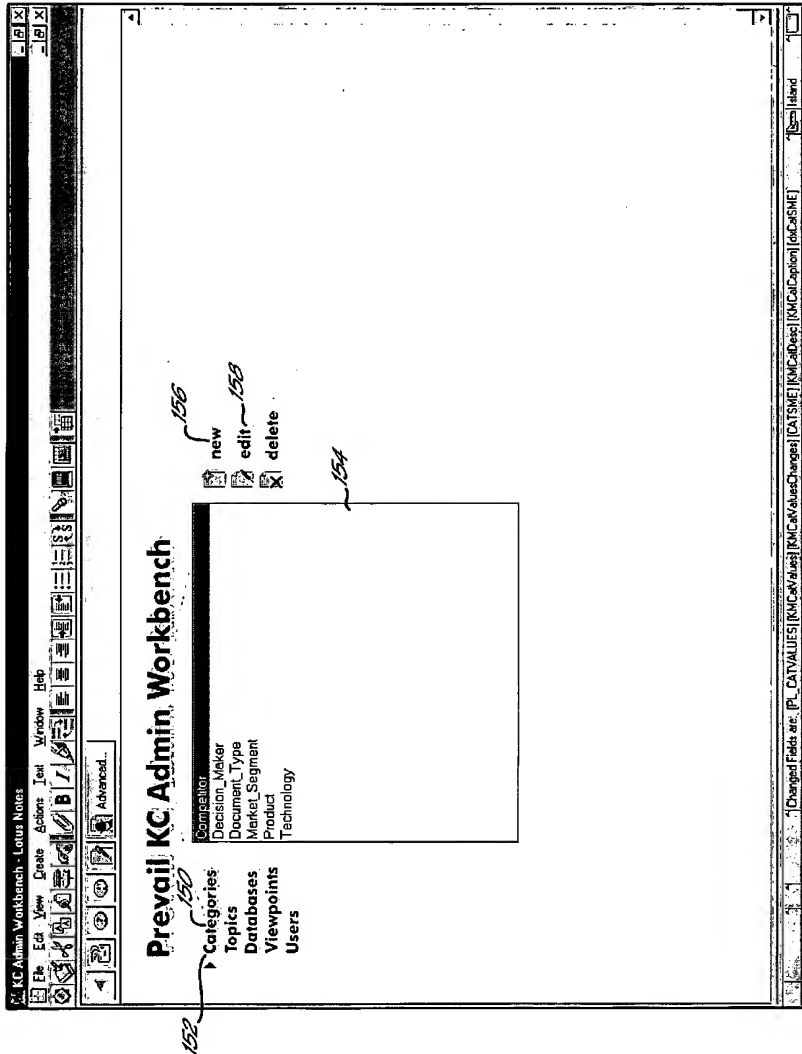
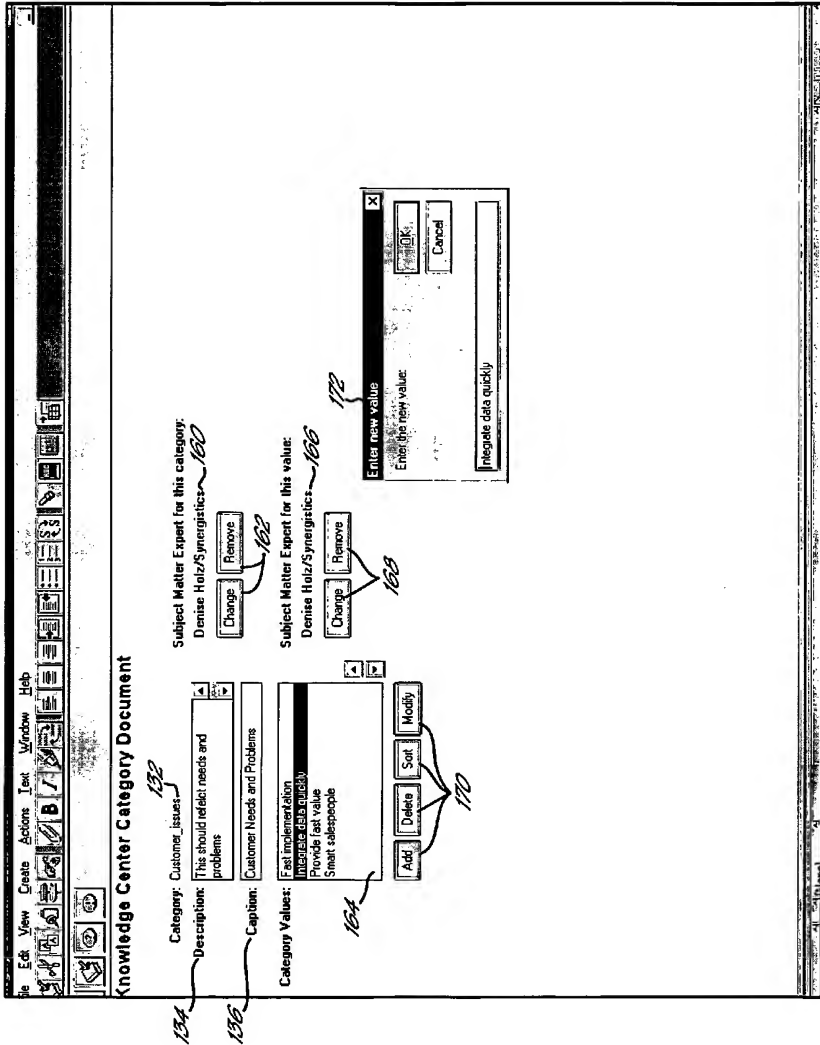


FIG. 2B





Category Definition - Lotus Notes

File Edit View Create Actions Text Window Help

Knowledge Center Category Document

Category: Customer\_issues

Description: This should reflect needs and problems

Caption: Customer Needs and Problems

Category Values:

Fast Implementation	
Medium Implementation	
Slow Implementation	
Smart Subpeople	

Change Remove

Subject Matter Expert for this category:  
Denise Holz/Synergistics

Propagate Changes?

Do you want to propagate this change throughout the Knowledge Center Advocated and Recognized content?

Yes No

174 175 176

Add Delete Sort Modify

FIG. 2D

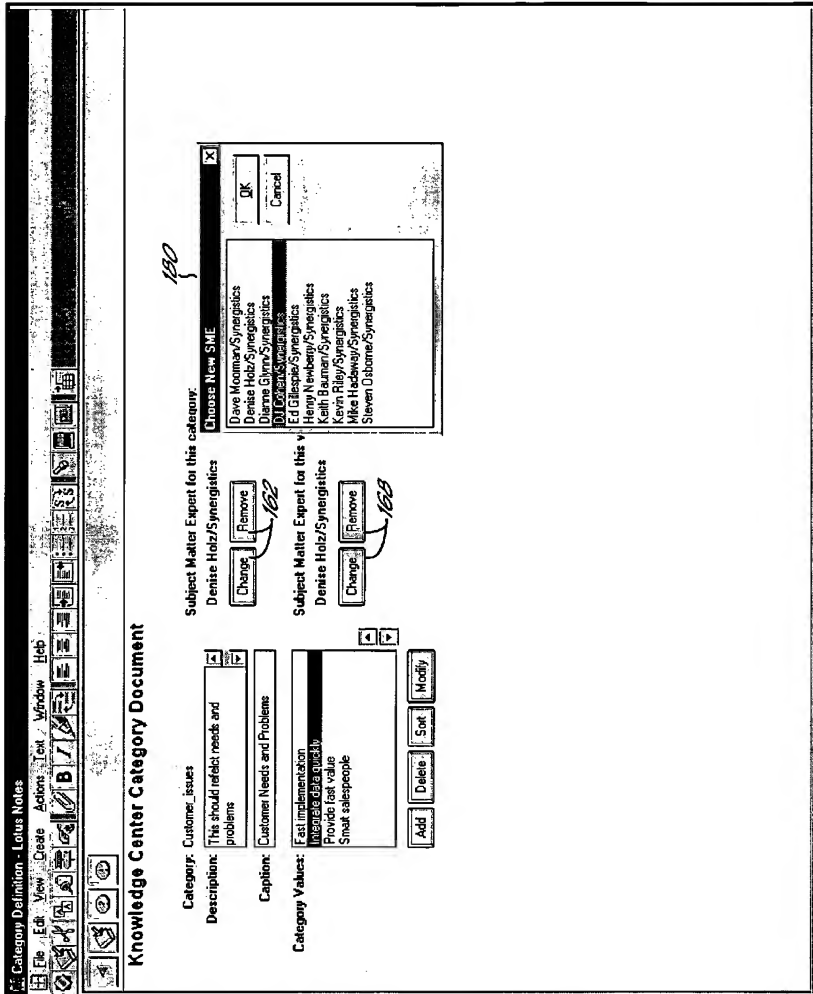
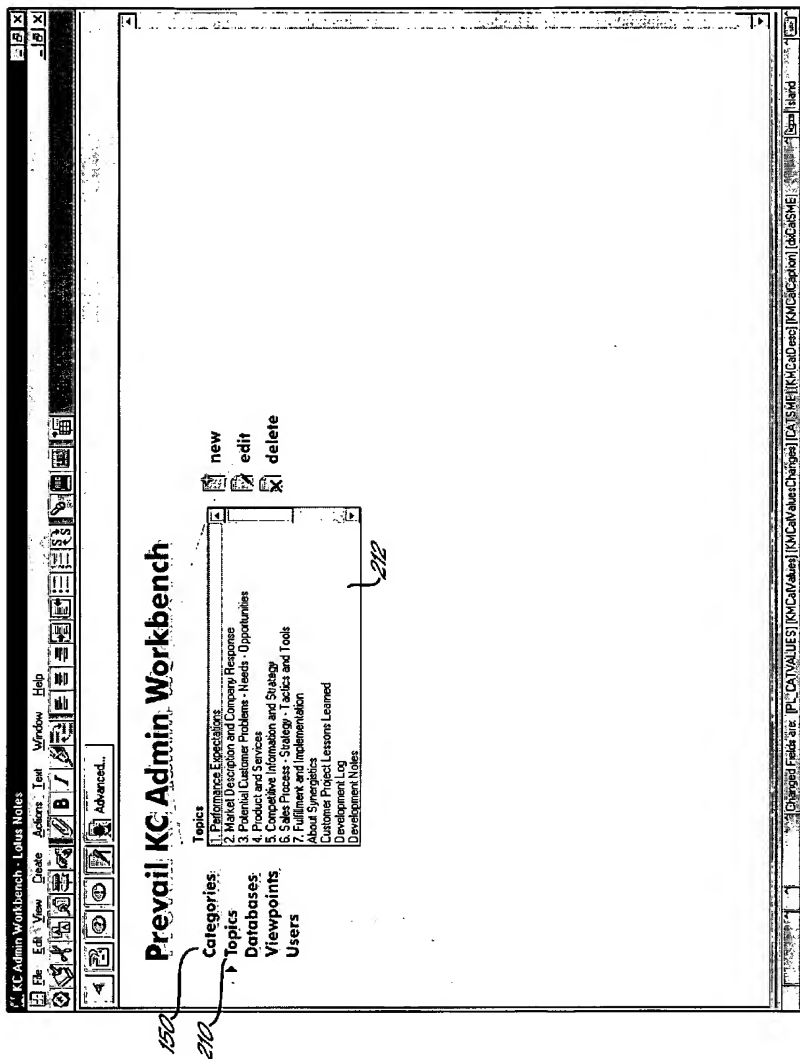


FIG. 2E



**FIG. 3B**

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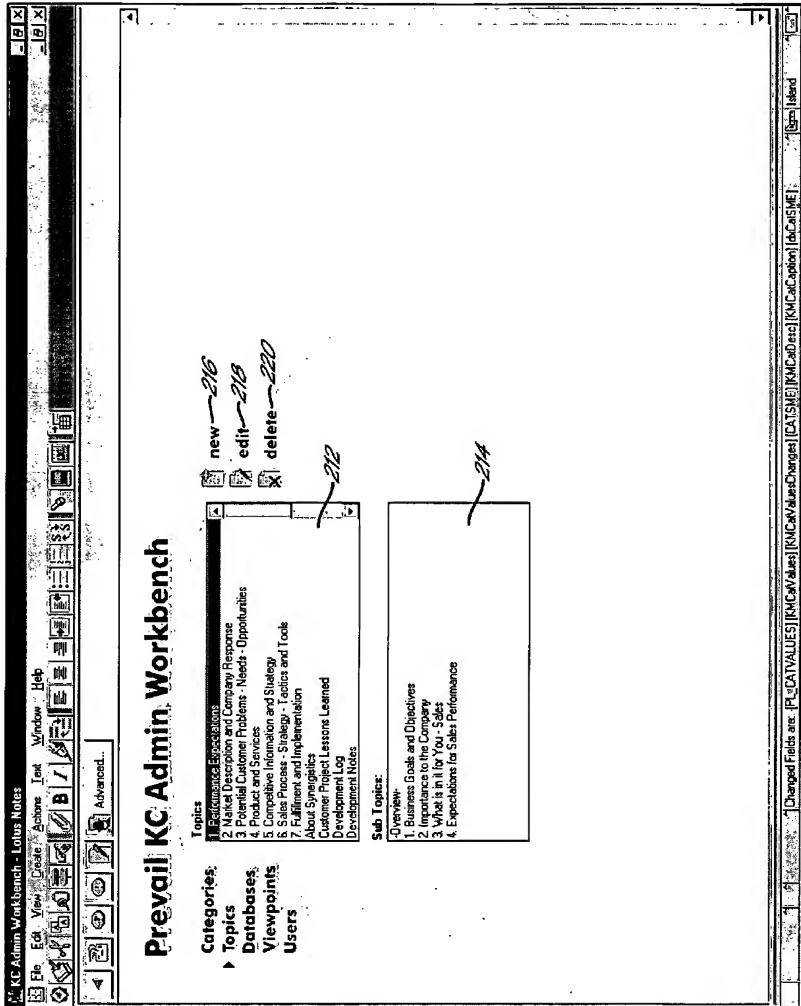


FIG. 3C

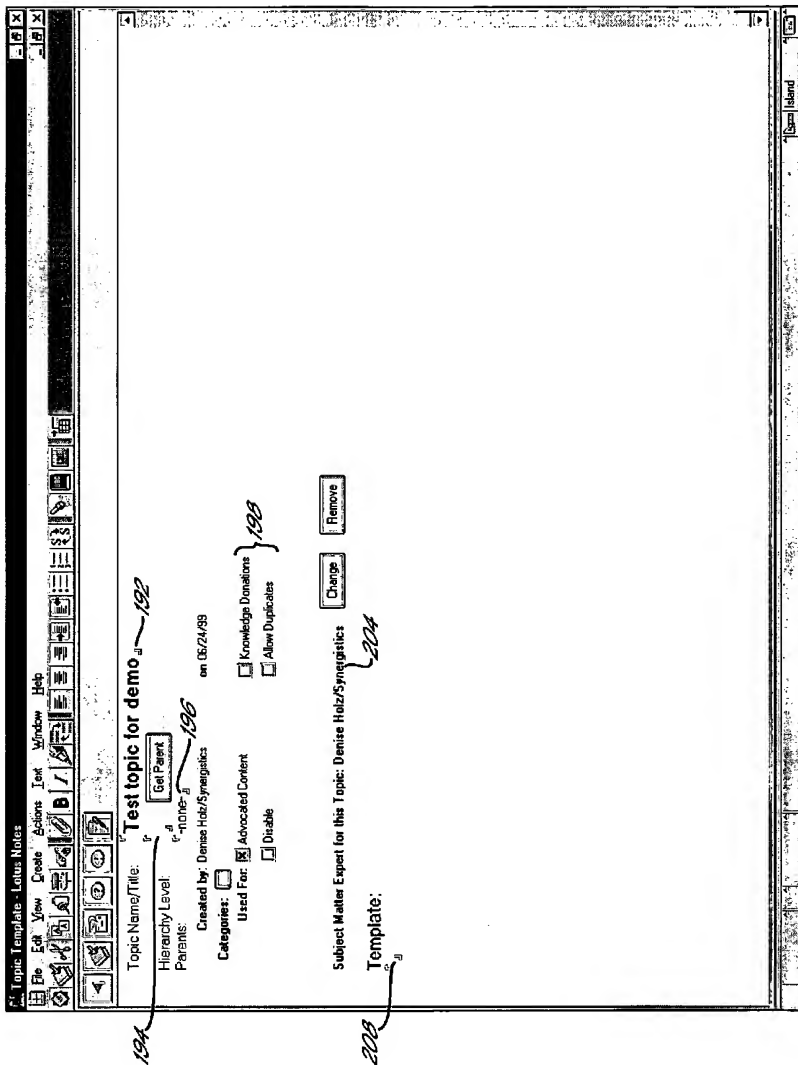


FIG. 3D

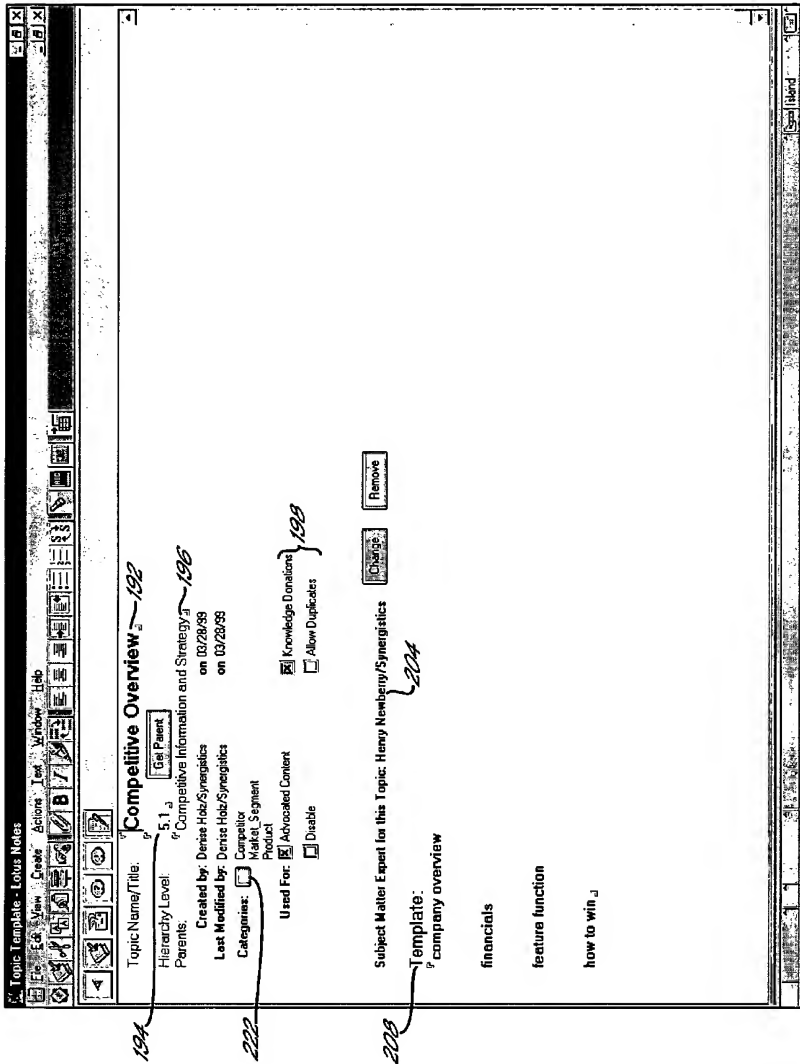


FIG. 3E

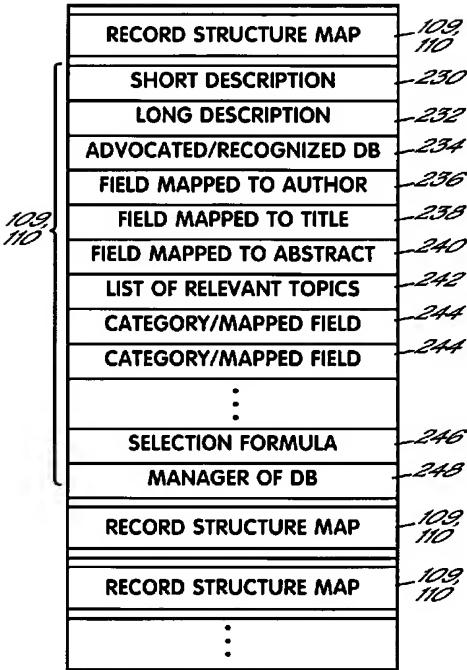


FIG. 4A

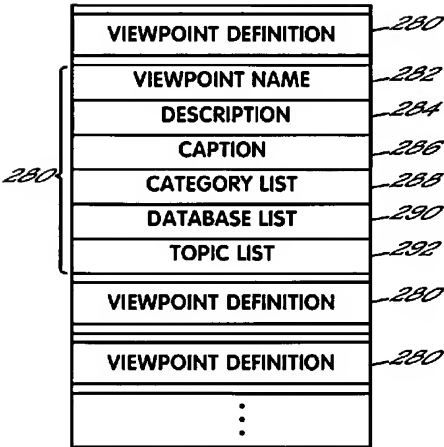


FIG. 5A

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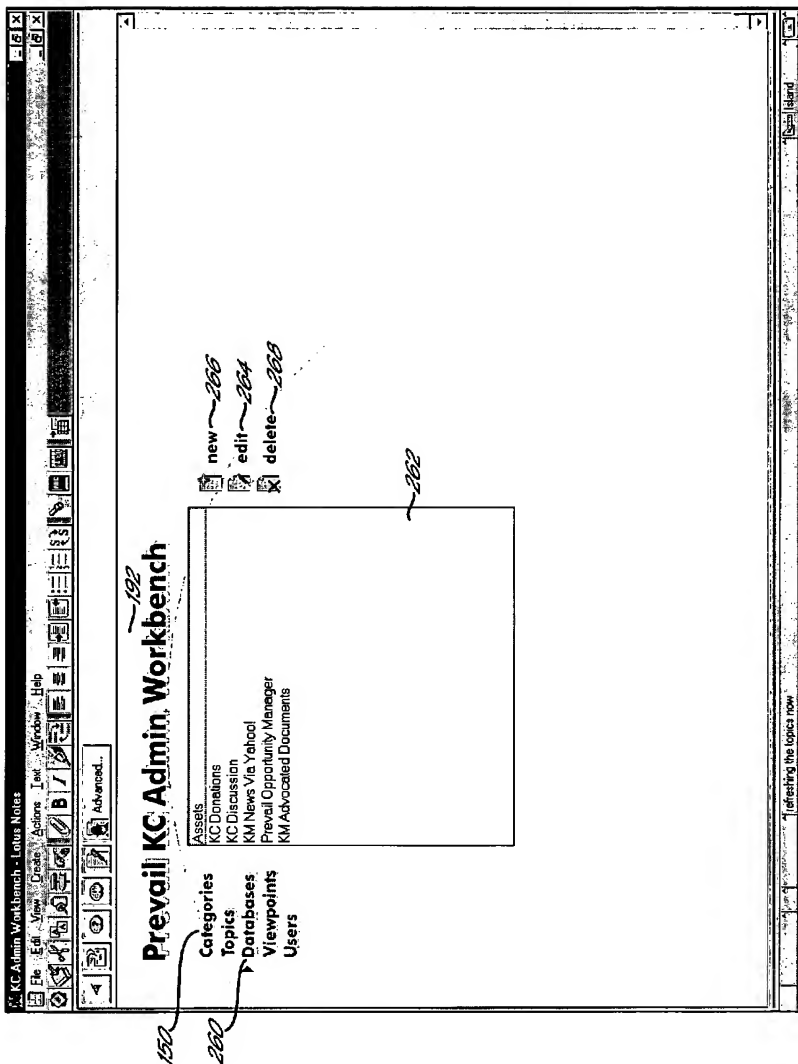


FIG. 4B



Opportunity Mgr (PDEV2) - Lotus Notes

File Edit View Database Actions Help

Class Save Database Entry

### Opportunity Mgr (PDEV2)

Short Description: Preval Opportunity Manager 230

Long Description: 232

Database Type: Advanced

Author Field: SalesRep 236

Title Field: OpName 233

Abstract Field: ViewSubjectOp 240

Edit Searching Parameters

These categories map to...

Compiler  
Product  
Market Segment  
Selection formula  
(FORM="OPPORTUN")

More Information:

Manager(s):  
Preval\_DevCenter\_Servers, Preval\_DevCenter\_Designers

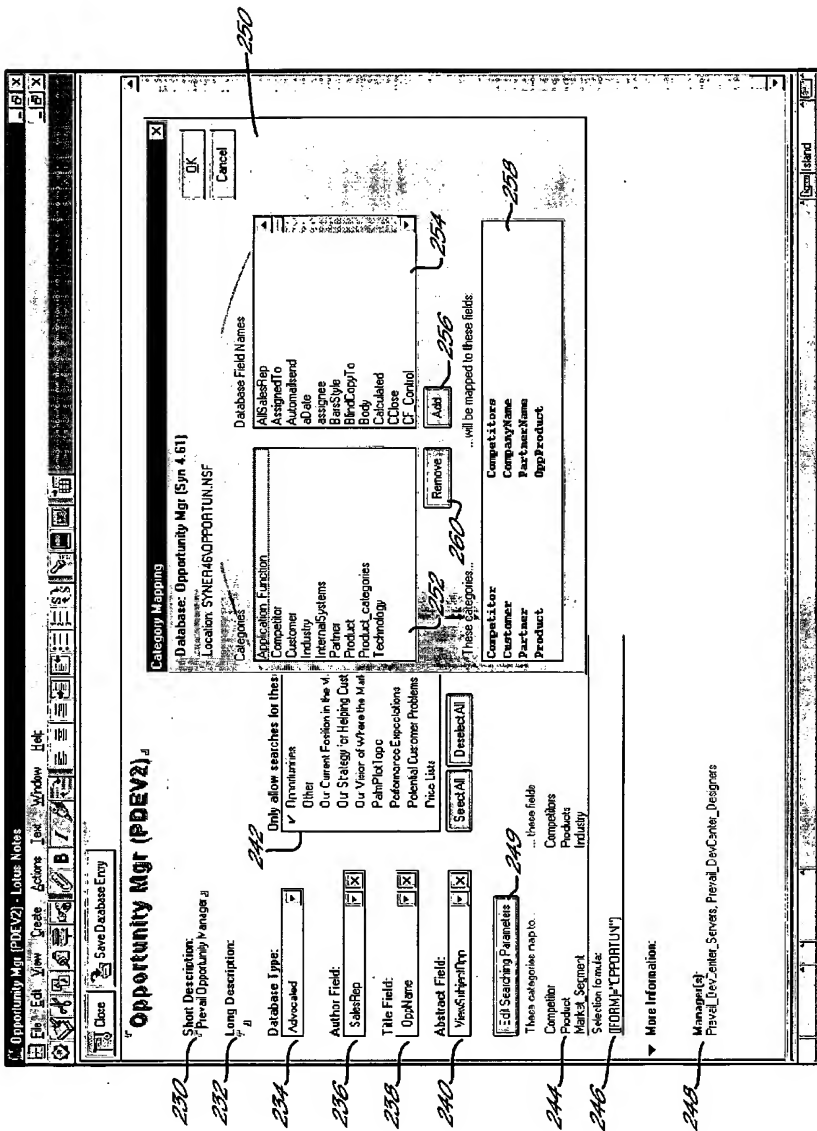
Only allow searches for these Topics:

- ☒ Opportunities
- ☐ Other
- ☐ Our Current Position in the Market
- ☐ Our Strategy for Helping Customers
- ☐ Our Vision of Where the Market is Going
- ☐ Pain/Hot Topic
- ☐ Performance Expectations
- ☐ Potential Customer Problems - Needs - Opportunities
- ☐ Price Lists

Select All Deselect All

234 236 233 240 244 246 248

FIG. 4C



**FIG. 4D**

Opportunity Mgr (PDEV2) - Lotus Notes

File Edit View Create Actions Test Window Help

Use Save Database Entry

### Opportunity Mgr (PDEV2)

Short Description:  
Prevail/Opportunity Manages

Long Description:  
g

Database Type:  
Advanced

Author Field:  
SalesRep

Title Field:  
OpName

Abstract Field:  
ViewSalesYr

Full Searching Parameters

These categories map to...

Competitor  
Product  
Market Segment  
Selection formula

[FORMULA: "OPPORTUNITY"]

More Information:

Managed by:  
Prevail/DevCenter\_Servers\_Prevail/DevCenter\_Designers

#### Category Mapping

Database: Opportunity Mgr (Syn 4.61)  
Location: SYNER46/OPPORTUNITY.NSF

Competitor  
Customer  
Product

Competitors  
Company Name  
Call Number  
Dip Product

Enter additional selection criteria:

1. Choose a field  
2. Type in a value  
3. Choose an operator

Accounting  
Account Type  
Account Name  
Account Product

Contains  
Contains  
Contains

Form = "Opportunity"

262

266

268

272

270

249

FIG. 4E

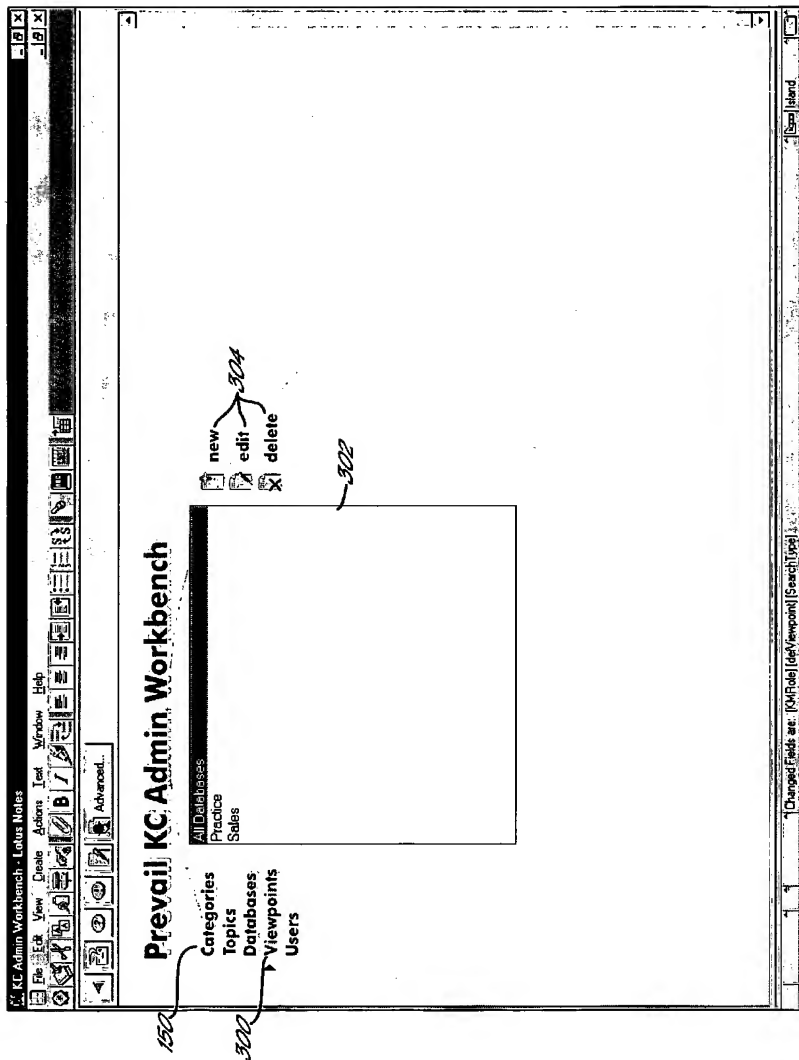


FIG. 5B

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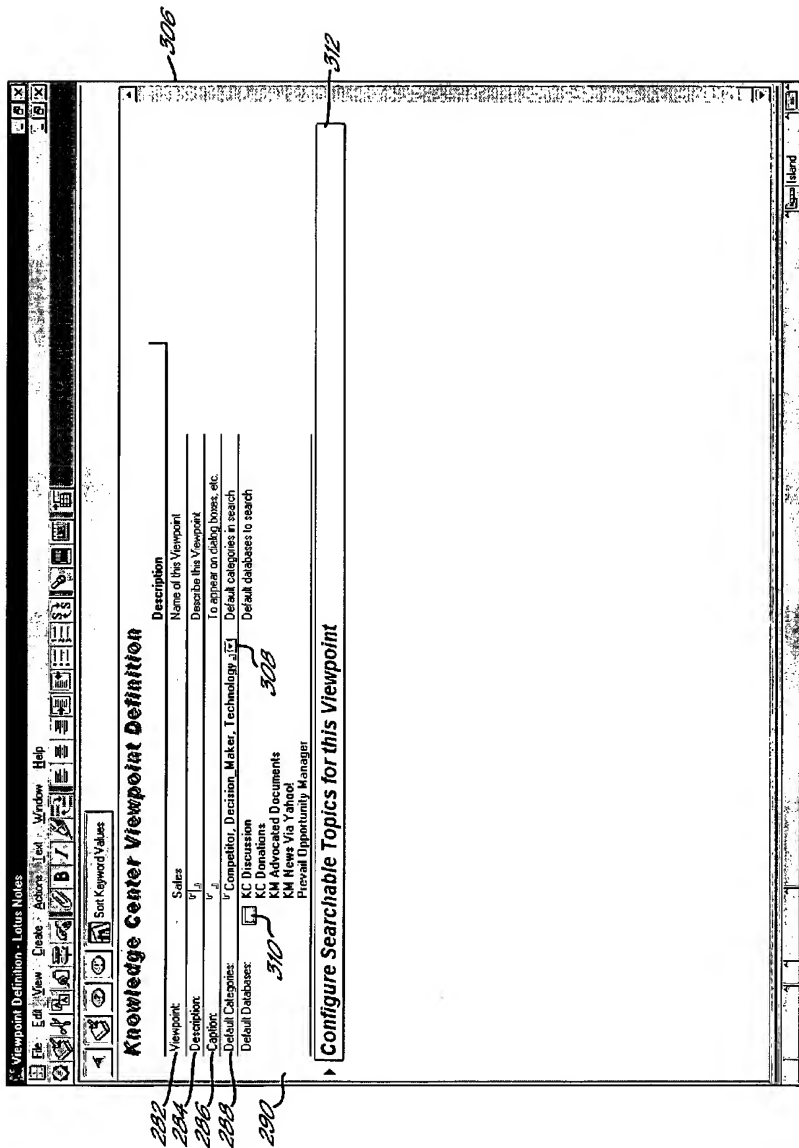


FIG. 5C

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**Viewpoint Definition - Lotus Notes**

File Edit View Options Actions Section Window Help

Sort Keyword Values

### Knowledge Center Viewpoint Definition

Viewpoint:	Description
- Sales	Name of this Viewpoint
V A	Describe this Viewpoint
V A	To appear on dialog boxes, etc.
Default Category:	Default categories in search
Default Database:	Default databases to search
<input type="checkbox"/> KM Discussion <input type="checkbox"/> KM Documents <input type="checkbox"/> KM News Via Yahoo!	
Preval Opportunity Manager	

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### Configure Searchable Topics for this Viewpoint

1. Select Topic:

1. Performance Expectations	320
2. Market Description and Company Response	318
3. Potential Customer Problems - Needs - Opportunities	
4. Product and Services	

3. Selected Topics:

1. Performance Expectations - Overview	322
1. Performance Expectations - 3. What is in for You - Sales	314
2. Market Description and Company Response - Overview	
3. Potential Customer Problems - Needs - Opportunities - Overview	
4. Product and Services - Overview	
5. Competitive Information and Strategy - Overview	318
6. Sales Process - Strategy - Tactics and Tools - Overview	

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FIG. 5D

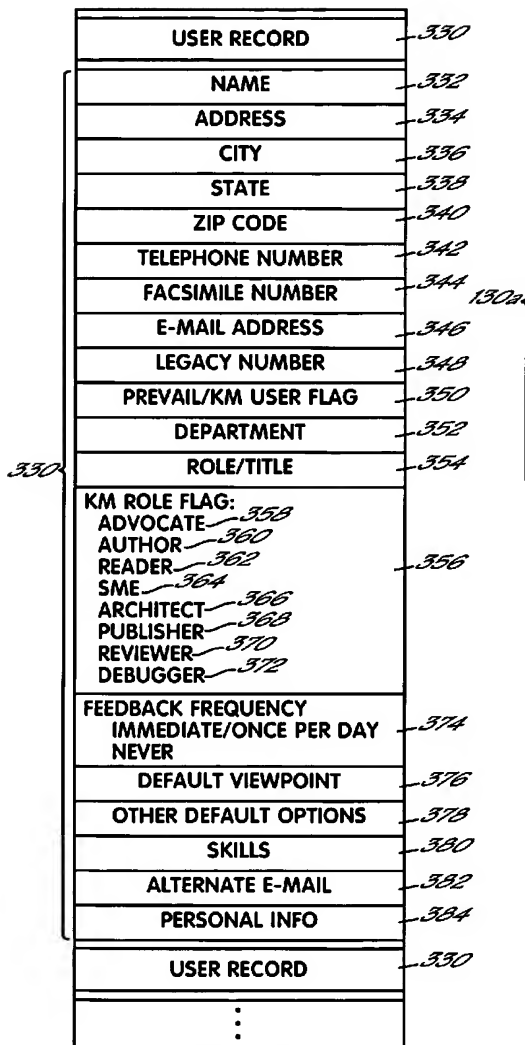


FIG. 6A

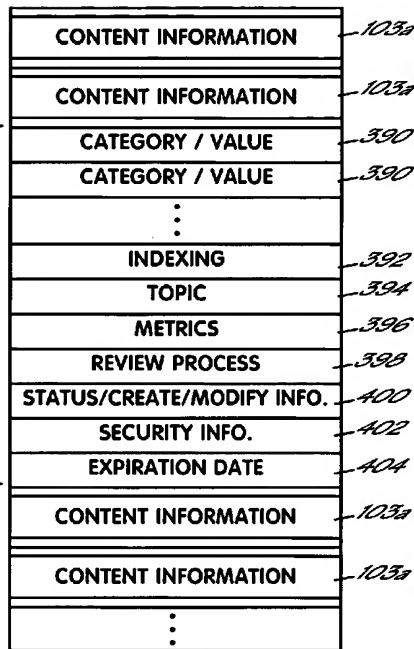


FIG. 7A

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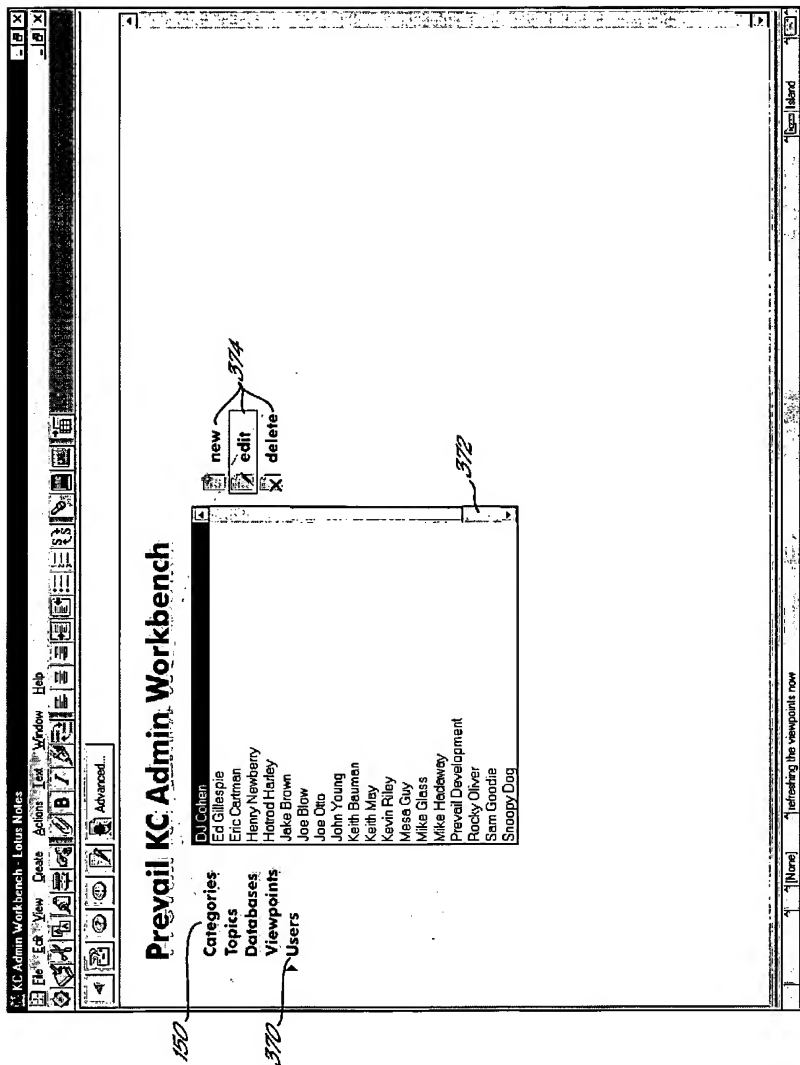


FIG. 6B



[illegible]

**FIG. 6C**

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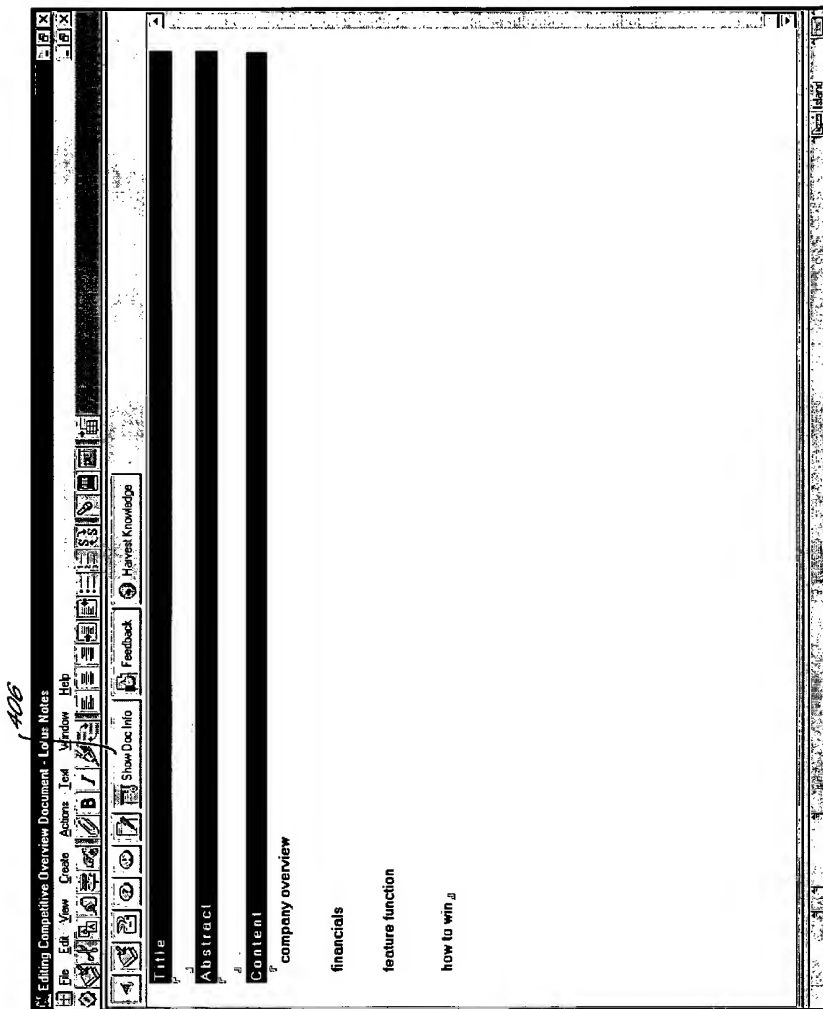


FIG. 7B

Editing Competitive Overview Document - Lotus Notes

File Edit View Create Actions Section Window Help

Document Properties

Document Information

Categories Values

Competitor <sup>1</sup> Act for Notes #1

Market Segment <sup>2</sup> Pharmaceuticals #1

Product <sup>3</sup> Preval Enterprise #1

PKC Number: DH02-498670 ~390

Content Key: DH02-498670

Topic: Competitive Overview ~394

Document Metrics:

Accuracy: N/A

Quality: N/A

Usefulness: N/A

Review Process:

Reviewers: No reviews have been assigned

Status: <sup>1</sup> Production #1

Created by: Denise Hob/Synergistics on: 06/24/99

Last Modified by: Denise Hob/Synergistics on: 06/24/99

Contact: <sup>1</sup> Denise Hob/Synergistics #1

Document Security

Expiration Date: 06/24/99

Title

Abstract

Change Topic

FIG. 7C

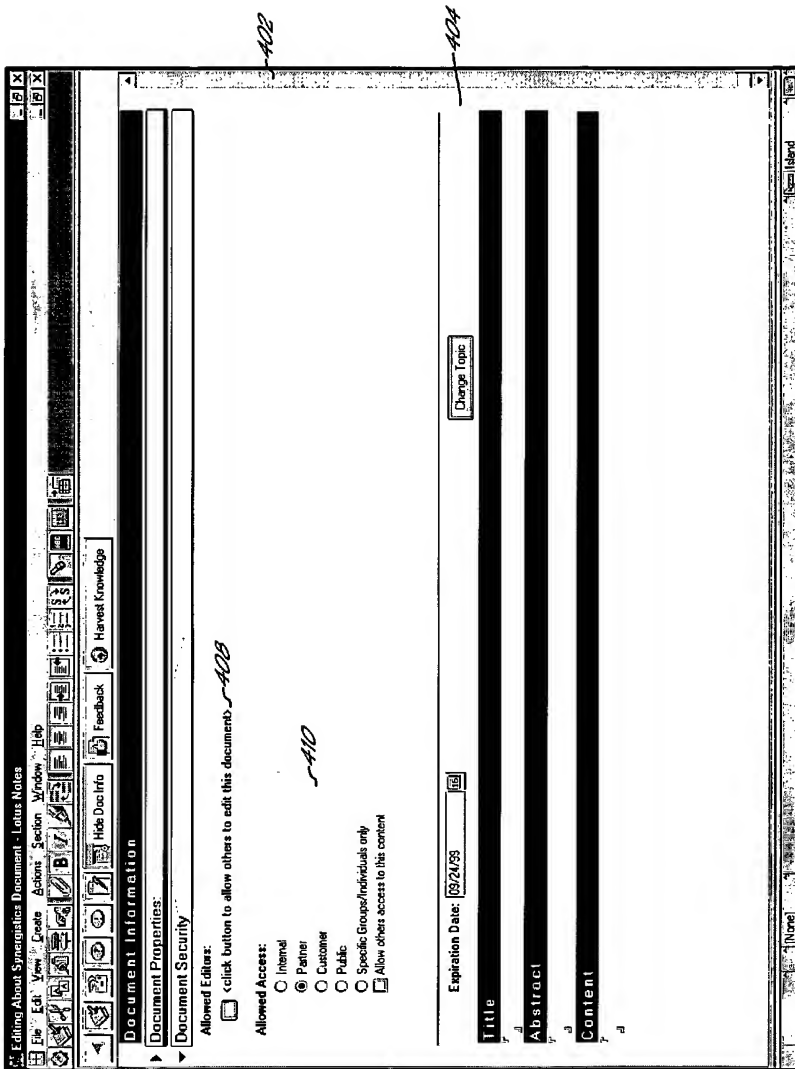


FIG. 7D

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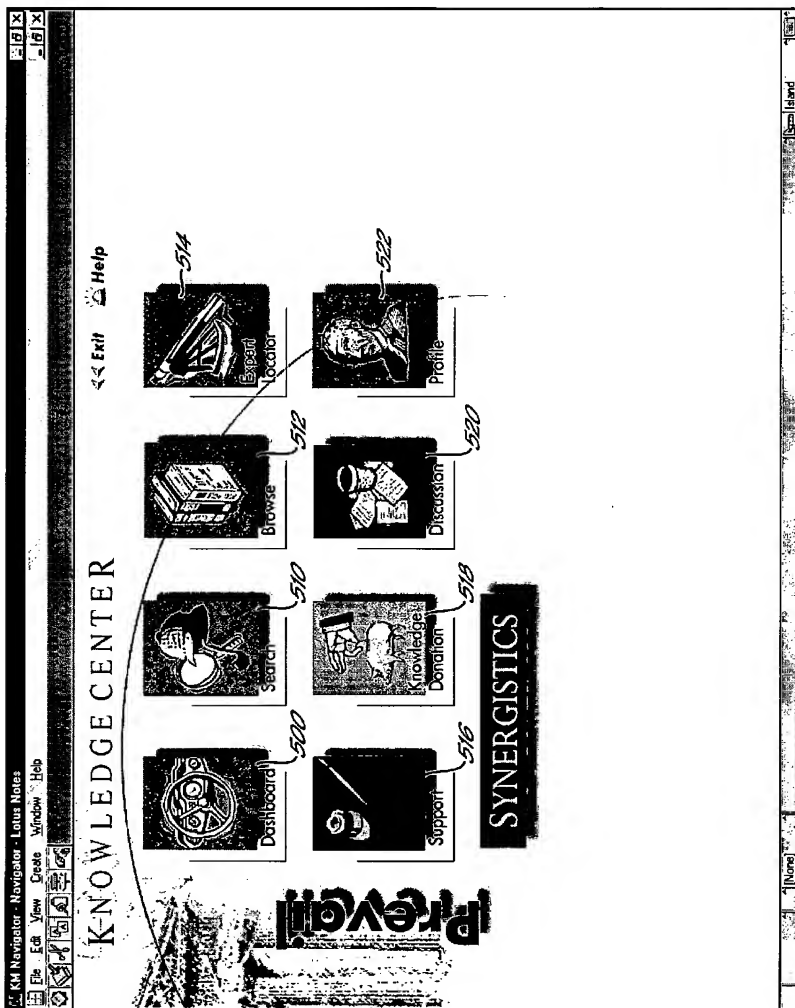
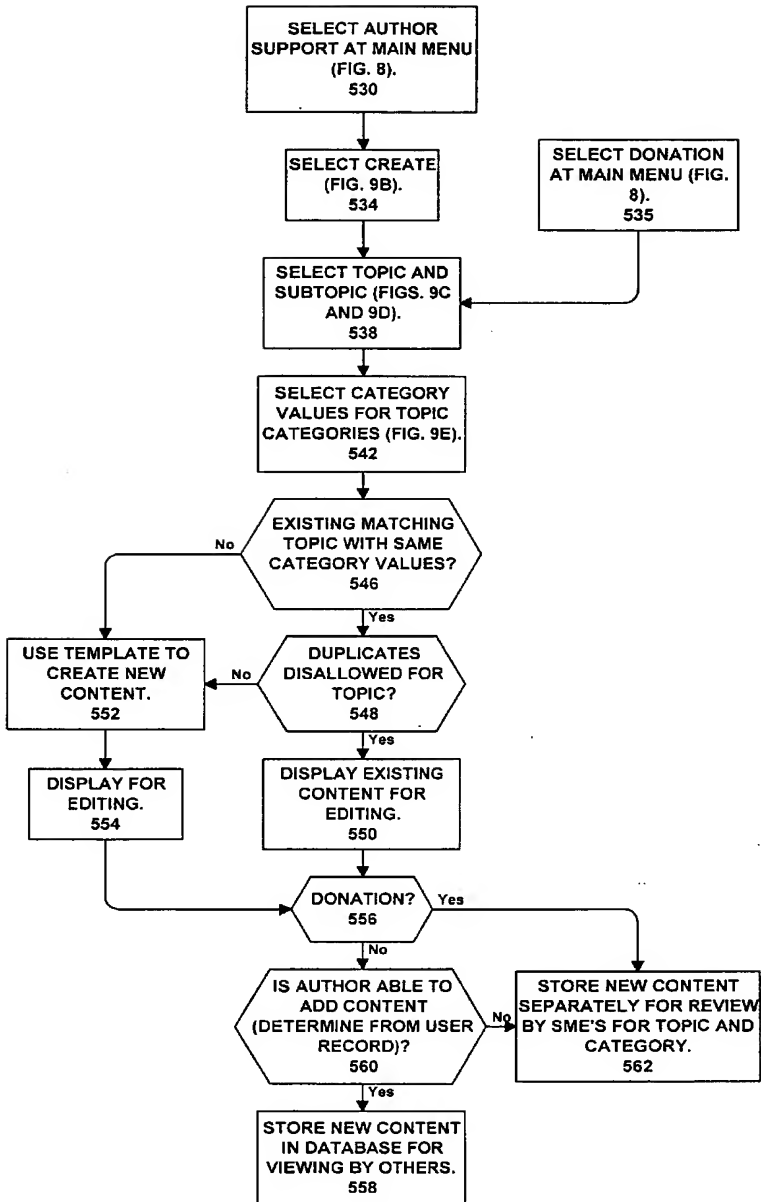


FIG. 8

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**FIG. 9A**

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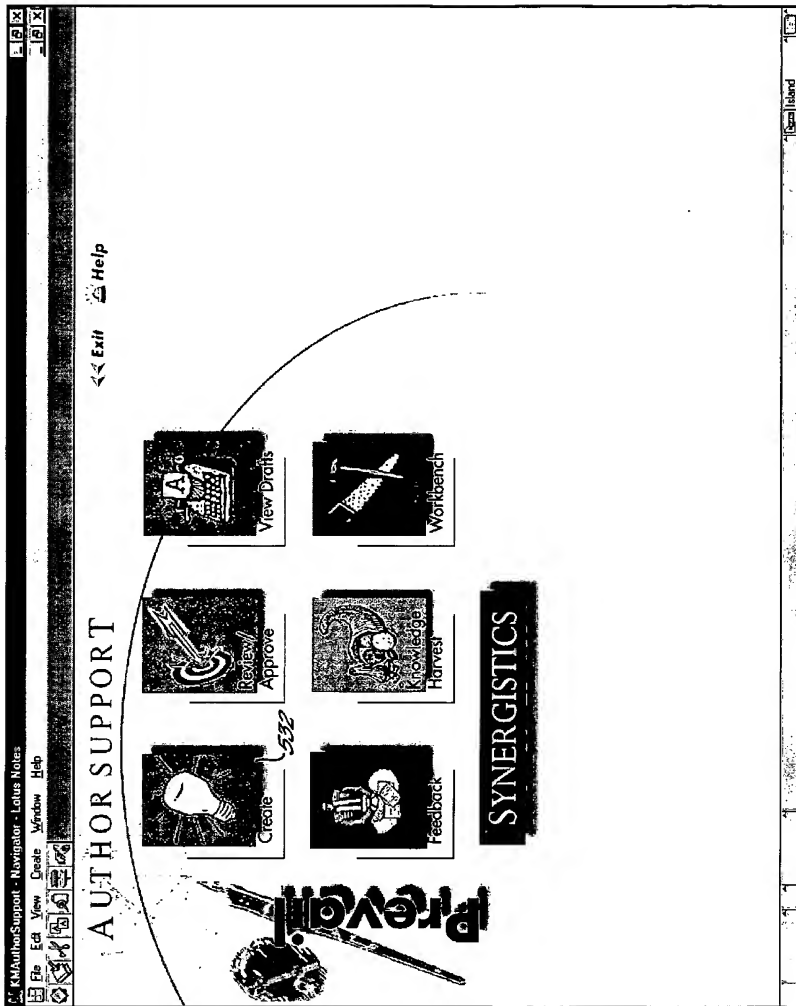


FIG. 9B

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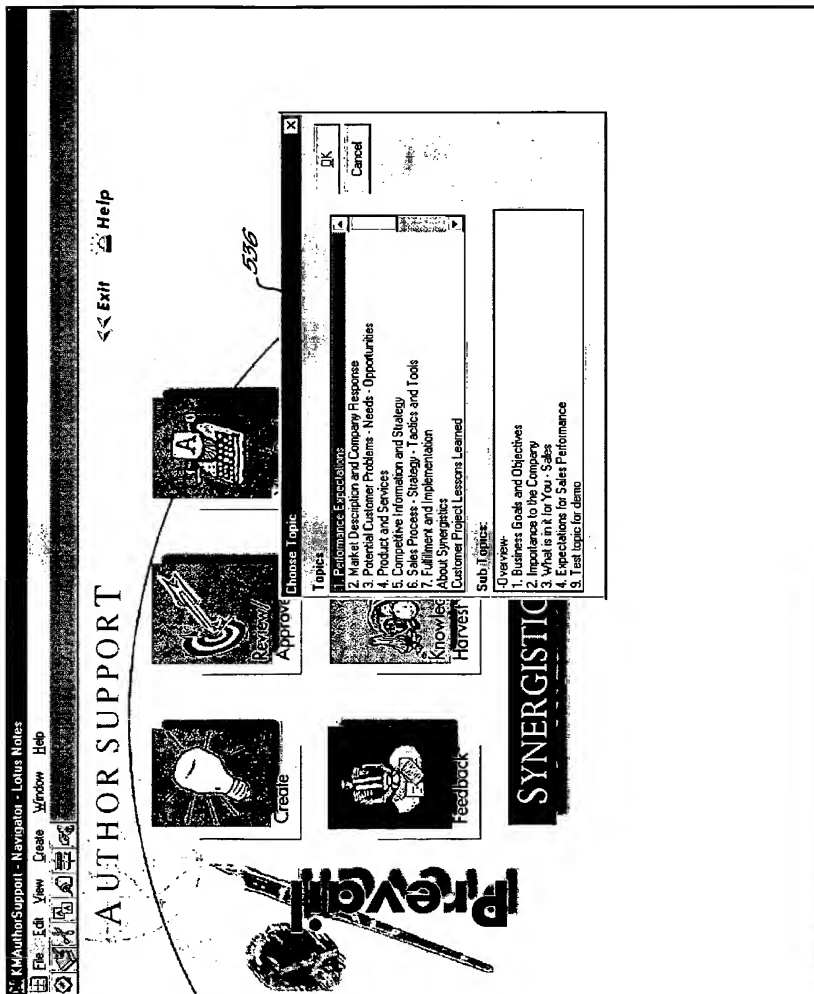


FIG. 9C



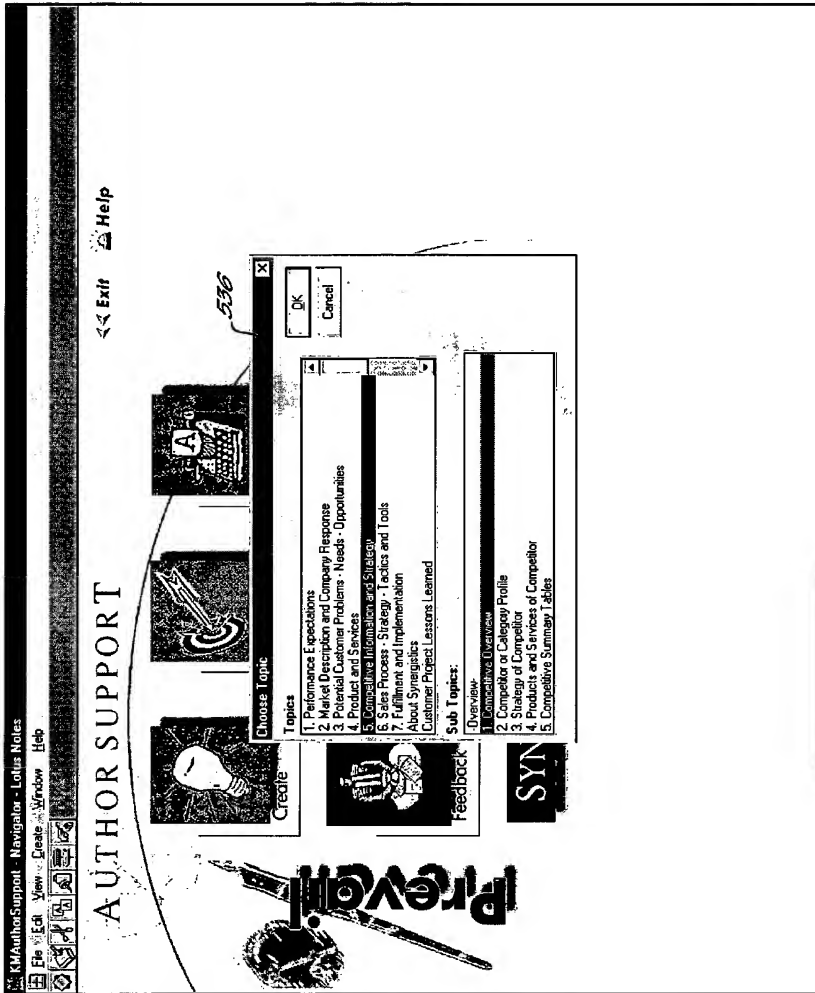


FIG. 9D

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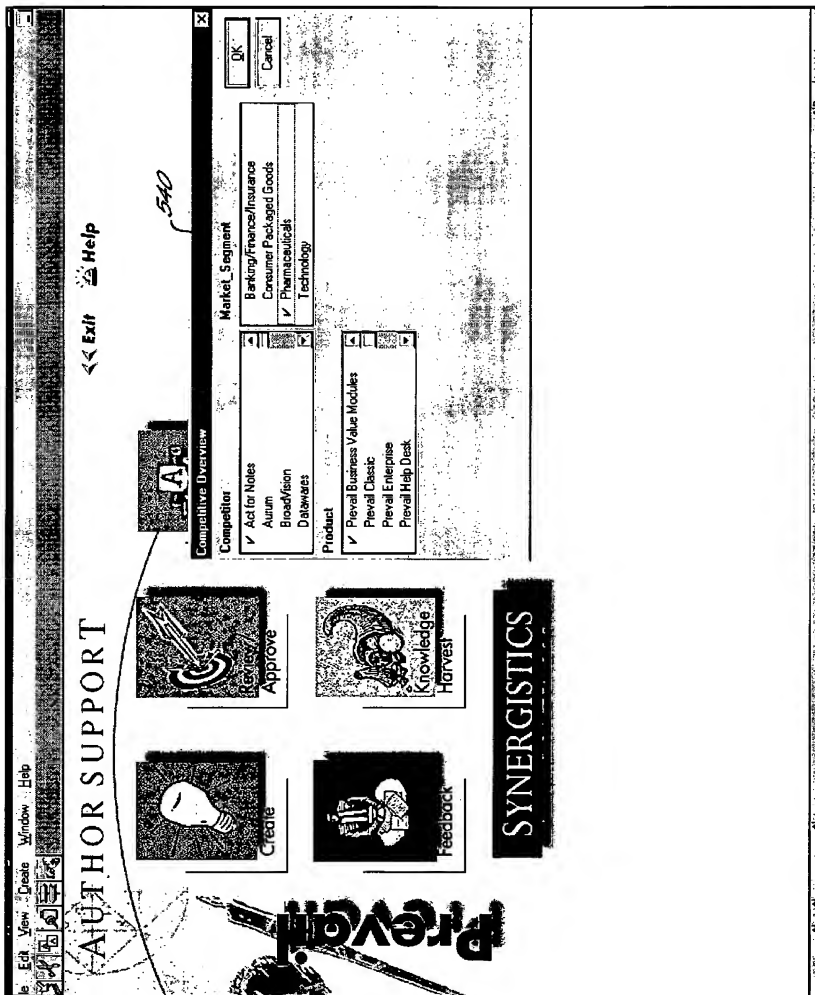
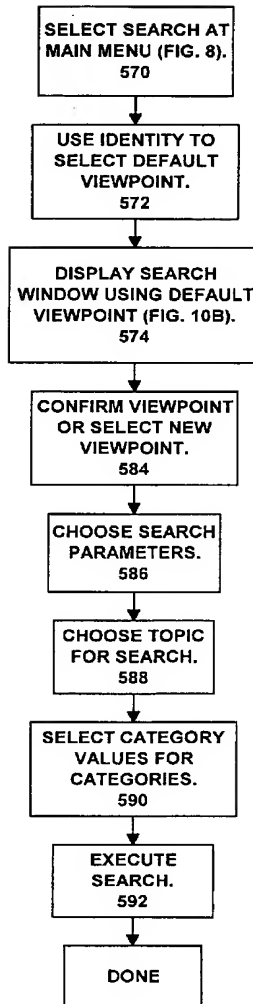


FIG. 9E

<sup>31/40</sup>  
**FIG. 10A**



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Prevail Knowledge Center Search - Lotus Notes

File Edit View Create Actions Session Window Help

Save Search Open Search Start Search

### Prevail Knowledge Center Search 594

New Search - Denise Holz, [06/24/99]

Simple Advanced Start Reset

Viewpoint Practice 576

Sort by: Newest first

Max Docs (0 = all) 0

☐ Exact word matches

☐ Use thesaurus

☒ Select Topics for Search 578

☒ Choose Categories to Search

Topic	Product
<input type="checkbox"/> General News <input type="checkbox"/> Functional Specifications Templates <input type="checkbox"/> Opportunities <input type="checkbox"/> Project Plan/FRS Templates <input type="checkbox"/> Technology Notes	<input type="checkbox"/> Banking/Finance/Insurance <input checked="" type="checkbox"/> Consumer Packaged Goods <input checked="" type="checkbox"/> Pharmaceuticals <input type="checkbox"/> Technology

590

592

CHOOSE DATABASES TO SEARCH

ADVANCED KEYWORDS

SEARCH BY DATE

594

576

578

590

592

Prevail Knowledge Center Search - Denise Holz, [06/24/99]

Simple Advanced Start Reset

Viewpoint Practice 576

Sort by: Newest first

Max Docs (0 = all) 0

☐ Exact word matches

☐ Use thesaurus

☒ Select Topics for Search 578

☒ Choose Categories to Search

Topic	Product
<input type="checkbox"/> General News <input type="checkbox"/> Functional Specifications Templates <input type="checkbox"/> Opportunities <input type="checkbox"/> Project Plan/FRS Templates <input type="checkbox"/> Technology Notes	<input type="checkbox"/> Banking/Finance/Insurance <input checked="" type="checkbox"/> Consumer Packaged Goods <input checked="" type="checkbox"/> Pharmaceuticals <input type="checkbox"/> Technology

590

592

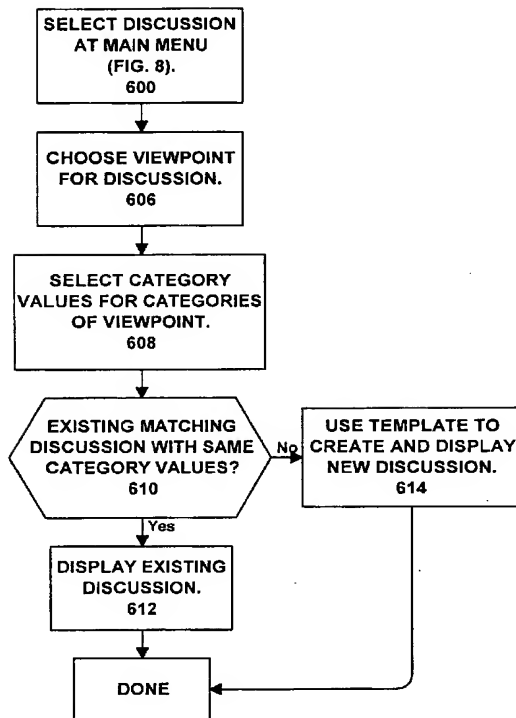
CHOOSE DATABASES TO SEARCH

ADVANCED KEYWORDS

SEARCH BY DATE

FIG. 10B

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**FIG. 11A**



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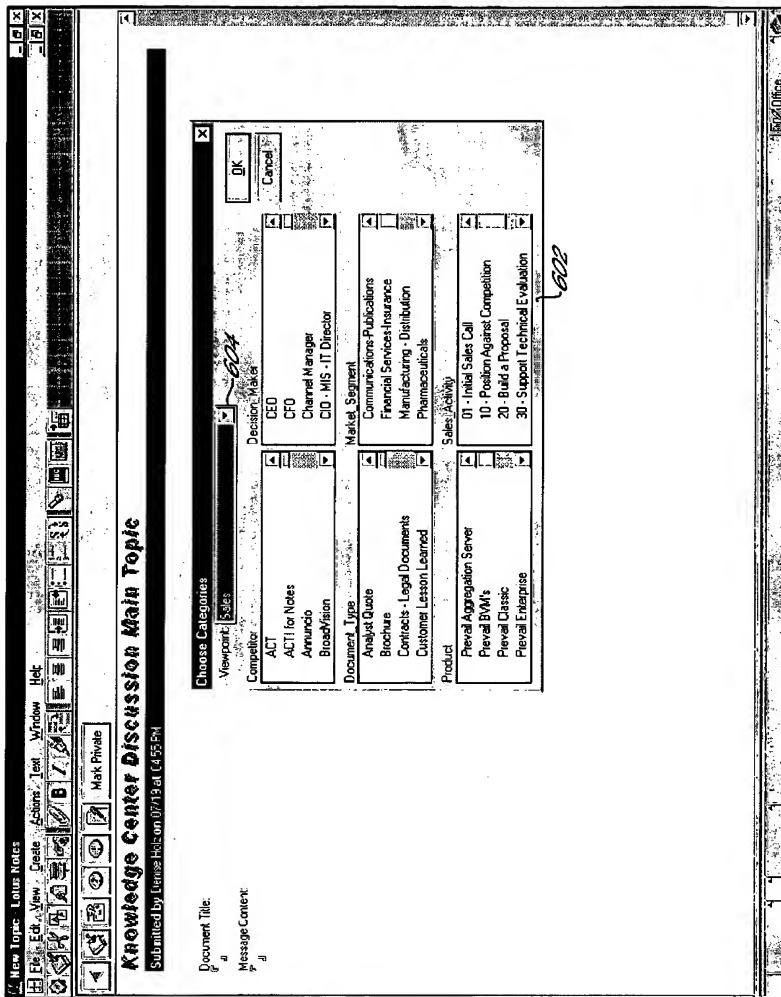


FIG. 11B

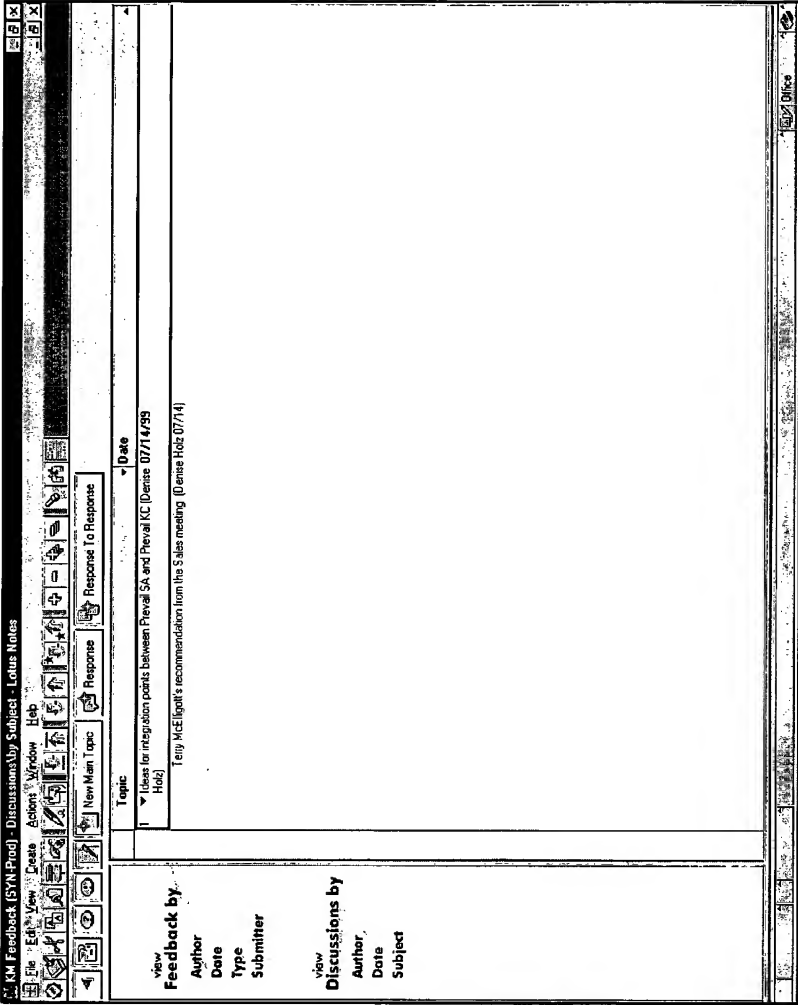
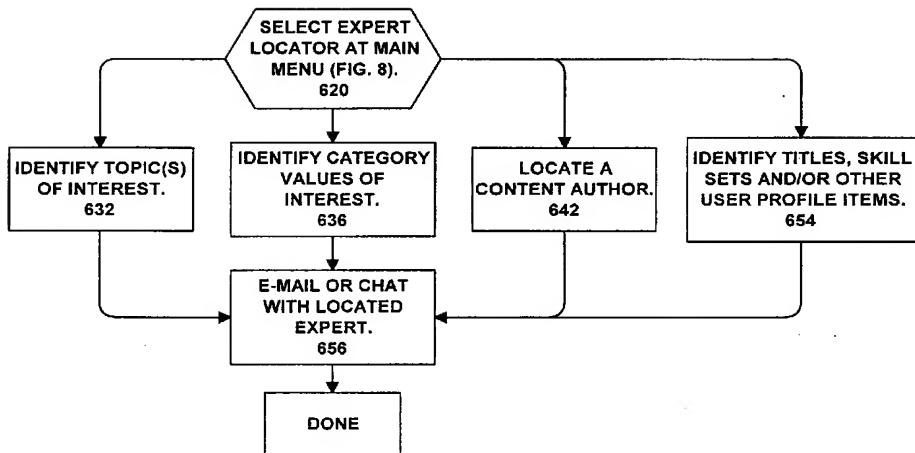


FIG. 11C

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**FIG. 12A**





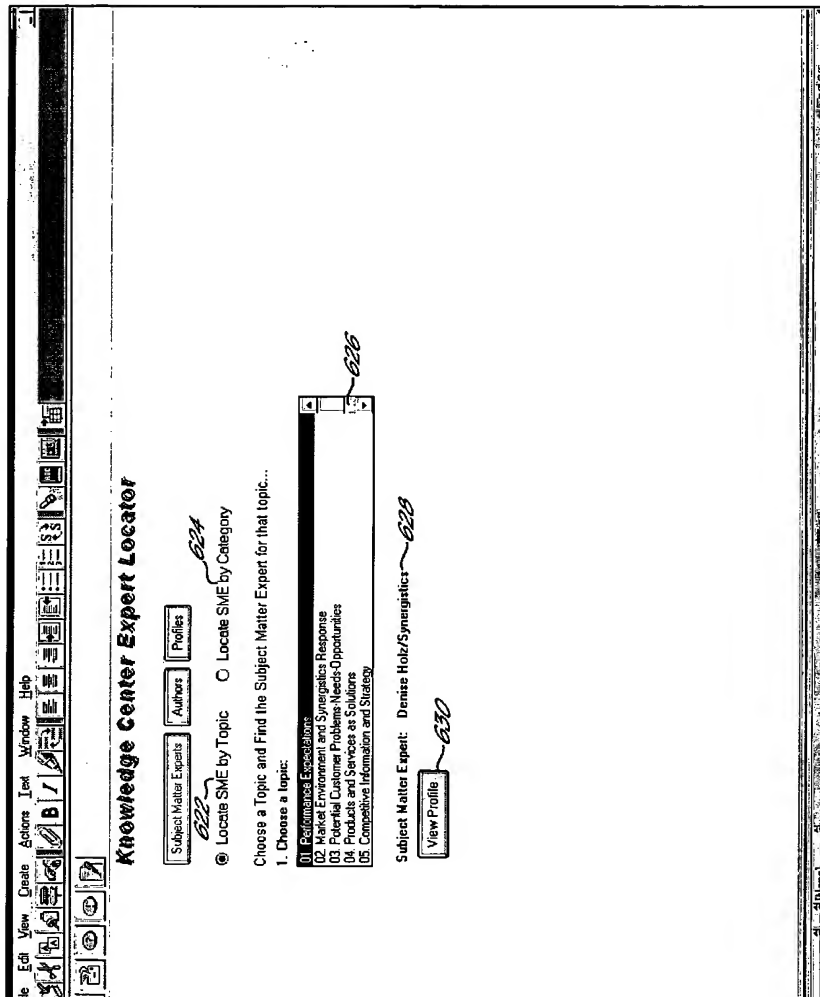


FIG. 12B

Search Form - Lotus Notes  
File Edit View Create Go Back Forward Help

**Knowledge Center Expert Locator**

☐ Locate Author by Topic
 ☒ <sup>632</sup> Locate Author by Category
  <sup>634</sup>

Choose a set of Categories and Values below, then click the [Find] button to retrieve the author(s) associated with those values...

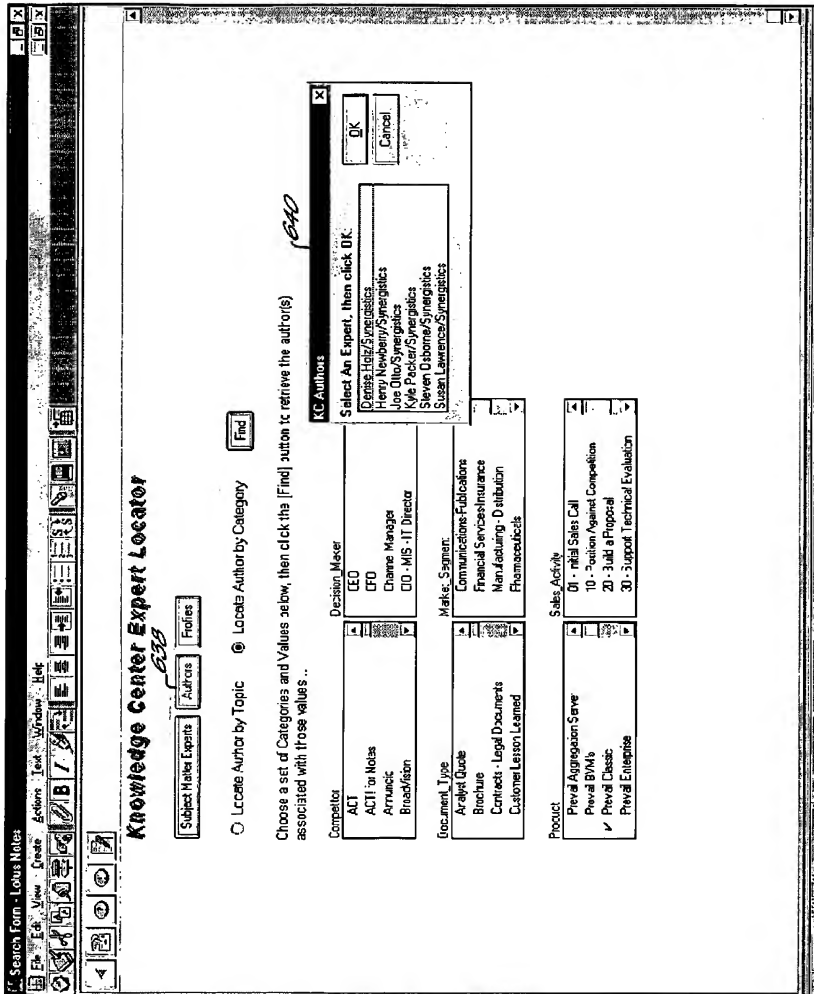
<b>Competitor</b> ACT ACT/Tra Notes Amnaco Broadvision	<b>Decision Maker</b> CEO CFO Channel Manager CIO - MIS - IT Director
<b>Document Type</b> Analyst Quote Brochure Contracts - Legal Documents Customer Lesson Learned	<b>Market Segment</b> Communications-Publications Financial Services-Insurance Manufacturing - Distribution Pharmaceuticals
<b>Product</b> Prevail Aggregation Server Prevail BSM's Prevail Basic Prevail Enterprise	<b>Sales Activity</b> 01 - Initial Sales Call 10 - Position Against Competition 20 - Build a Proposal 30 - Support Technical Evaluation

<sup>632</sup>

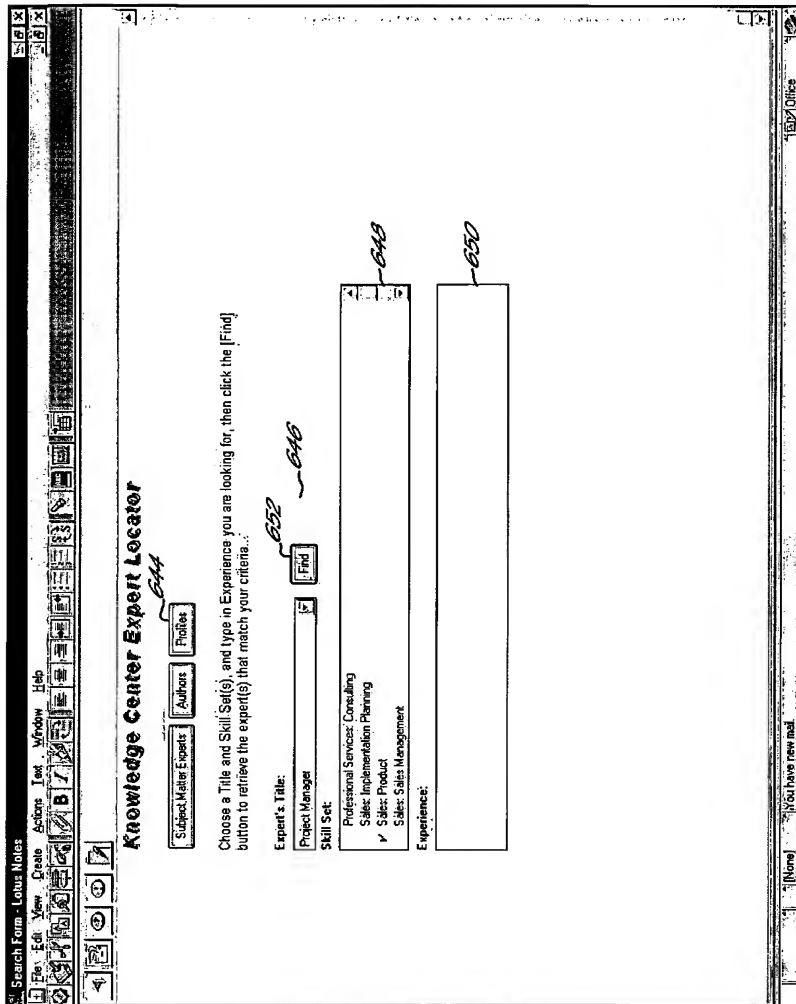
<sup>634</sup>

You have new mail

FIG. 12C



**FIG. 12D**



**FIG. 12E**

## INTERNATIONAL SEARCH REPORT

 International Application No  
 PCT/US 99/16911

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G06N5/02 G06F17/60 G06F17/30

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G06N G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, INSPEC

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	ELOFSON G: "INTELLIGENT AGENTS EXTEND KNOWLEDGE-BASED SYSTEMS FEASIBILITY" IBM SYSTEMS JOURNAL, US, IBM CORP. ARMONK, NEW YORK, vol. 34, no. 1, 1 January 1995 (1995-01-01), pages 78-95, XP000500284 ISSN: 0018-8670 page 83, left-hand column, line 20 -page 88, right-hand column, line 36	1,2,6,7, 9,10, 12-16, 24-28
X	US 5 752 242 A (HAVENS CHARNELL T) 12 May 1998 (1998-05-12) abstract; figure 3 column 10, line 50 -column 12, line 34 --- -/--	31-34



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

## \* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

/\* document member of the same patent family

Date of the actual completion of the international search

13 October 2000

Date of mailing of the international search report

03. 11. 2000

Name and mailing address of the ISA

 European Patent Office, P.B. 5818 Patentlaan 2  
 NL - 2280 HV Rijswijk  
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
 Fax: (+31-70) 340-3016

Authorized officer

Kingma, Y

## INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US 99/16911

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 544 360 A (LEWAK JERZY ET AL) 6 August 1996 (1996-08-06) abstract; claims 1,4,5,7,9 -----	33,35
A	WO 98 37499 A (RUBINSTEIN SEYMOUR I) 27 August 1998 (1998-08-27) abstract; figures 7,8 page 22, line 1 -page 23, line 28 -----	31,32, 36,38-40
X	US 5 754 939 A (MARCUS MITCHELL P ET AL) 19 May 1998 (1998-05-19) abstract column 1, line 43 -column 3, line 34 column 8, line 46 -column 9, line 63 column 25, line 4 - line 43 column 55, line 41 -column 57, line 36 column 73, line 1 -column 76, line 43 -----	41-45

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US 99/16911

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-30

Content items with formats and categories

2. Claims: 31-40

Generating a query for accessing a database

3. Claims: 41-47

Receiving input specifying two categories



# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 99/16911

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
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